Severnside

A Feasibility Study

The Central Unit for Environmental Planning

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PREFACE

1. This is the third and last of three major locational studies announced in 1966. The then First Secretary of State told the House of Commons that the Government wes putting in hand a study of the Humberside area and that in addition the Severnside and Tayside areas had been identified for early study, to see whether it would be feasible to undertake large-scale development there to accommodate part of the substantial population increase expected to take place in Great Britain by the end of the century.

2. In 1967 it was announced that the study of Severnside would begin and would include an examination of the physical and economic potential of the Area, in order to identify the main factors which would operate for or against a substantiel inflow of population. The Study would also cover the location, scale, cost and phasing of possible developments and whet effect a large growth of population on Severnside would have on neighbouring areas.

3. The task of carrying out the Study wes given to the Central Unit for Environmental Planning which hed been set up in July 1966 within the Department of Economic Affairs, and which was made up of officials, of that end other Government departments including the Welsh Office, who gave part of their time to the Unit. Following the machinery of government changes in 1969, the Unit continued its work under the aegis of the Ministry of Housing and Local Government.

4. The Central Unit was assisted by a Physical Planning Unit which was set up in Bristol under the direction of e member of the Central Unit to carry out the detailed physical study of the Area. Included in the Physical Planning Unit were staff seconded from locel planning authorities within the Study Area, as well as from the then Ministry of Housing and Local Government end the Welsh Office.

5. Much valuable work on the Study Area had elready been carried out by the Planning Councils and Boards and local planning authorities concerned and the Central Unit has profited from this.

6. Summaries of information on various topics were compiled in the course of the Central Unit's work. Not all this materiai is embodied in the main Study—some of it has been edited es a number of papers, copies of which are availeble from the Department of the Environment, Whitehall, or the Welsh Office, Cardiff.

7. Members of the Central Unit worked together as a team without regard to departmental responsibilities. Their recommendations, like the techniques of analysis and assessments used, are the Unit's own and do not commit in any way the Government departments and the local authorities whose staff participated in the work. The Study is now published in order to give all those concerned with plenning for the future of Severnside the opportunity to consider its implications and to express their views. In the light of these views, and of programmes and policies for the country es a whole, the Government will decide whether or not to accept any of the recommendations in the Study.

Department of the Environment and the Welsh Office

SEVERNSIDE
A FEASIBILITY STUDY

To:

Secretary of State for the Environment

In 1966 the then First Secretary of State for Economic Affairs commissioned three feasibility studies, of Humberside, Severnside and Teyside. The work of carrying out the first two was given to the Central Unit for Environmental Planning, and as Chairman of that Unit I now submit our report on Severnside, which completes the publication of all three.

As before, the members of the Unit heve worked as e team, independently of their various departments, and their conclusions and recommendations are their own.

This Study owes e great deal to the officers of the Welsh Office who essisted the Unit in preparing it, and also to the work of the Physical Planning Unit. I would like to record here our thanks to the following members of that Unit and to the local authorities of Bristol, Gloucestershire, Monmouthshire, Newport and Somerset who made their services available:

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CONTENTS

Part 1 The Report

		Paragraphs
CHAPTER 1	THE STUDY	1.1– 1.16
	THE TASK	1– 6
	THE AREA	7– 9
	TIME SCALES	10
	THE METHOD	11–16
	The physical approach	11–13
	The economic approach	14
	Synthesis	15–16
CHAPTER 2	CONCLUSIONS	2.1– 2.34
	THE AREA'S POTENTIALITIES	1–31
	Bristol-Bath	11–17
	North Gloucestershire	18–25
	Monmouthshire-Ross	26–29
	The Area as a whole	30–31
	EFFECTS ON NEIGHBOURING AREAS	32–33
	SUMMARY OF CONCLUSIONS	34

Tables in the text

		Page
2a	Study Area: population estimates on basis of past migration trends 1968-2001	6
2b	Study Area: population estimates on basis of accelerated growth 1968-2001	7
2c	Study Area: range of population increeses 1968-91 and 1968-2001	10

Figures in the text

		Page
No. 1	Definition of areas	3
2	Preferred strategy for growth	11

Part 2 The Analysis

		Paragraphs
CHAPTER 3	THE BASIC APPROACH	3.1– 3.21
	INTROOUCTION	1– 3
	THE PHYSICAL PLANNING APPROACH	4–10
	Population growth	4
	The nature of future urban areas	5– 8
	Lend requirements	9–10
	THE ECONOMIC APPROACH	11–17
	SYNTHESIS ANO INTERPRETATION	18–21
	Rate of growth	18
	Evaluation of alternatives	19–21
CHAPTER 4	STRATEGIC PHYSICAL PLANNING POTENTIAL	4.1– 4.93
	INTROOUCTION	1
	URBAN ANO SOCIAL INFRASTRUCTURE	2–19
	The urban hierarchy	2–11
	Education, health and welfare services	12–13
	Housing	14–16
	Places of architectural and historic interest	17–19
	COMMUNICATIONS	20–40
	General locetion	20
	Roeds	21–31
	Railways	32–36
	Airports	37–40
	NATURAL RESOURCES	41–78
	Agriculture	41–43
	Geology and minerals	44–62
	The countryside	63–70
	Weter resources	71–78
	THE ESTUARY	79–88
	Ports	79–84
	Maritime Industrial Development Areas	85–86
	Barreges	87–88

CHAPTER 4 Continued

	Paragraphs
BROAD INITIAL ASSESSMENT	89–91
Industrial land	89
Urban development	90–91
The Bristol area	91
The Lower Severn Valley	91
Lowland South-East Wales	91
The Wye Basin	91
CONCLUSIONS	92–93

	Page
ANNEX 4A DEFINITIONS OF AREAS USED IN THE TABLES	40

	Paragraphs
CHAPTER 5 LAND FOR LARGE-SCALE DEVELOPMENT	5.1– 5.78
INTRODUCTION	1
THE SELECTION PROCESS	2– 7
Stage 1	2– 4
Staga 2	5
Stage 3	6– 7
BRISTOL-BATH	8–33
Development Plans	6– 9
Tha longer term	10–30
The Bristol area	10–29
The Weston area	30
Summary: Bristol-Bath	31–33
NORTH GLOUCESTERSHIRE	34–48
Development Plans	34–35
The longer term	36–47
The east bank of the Severn	36–42
The west bank of the Severn and the Leadon Vallay	43–46
Other areas	47
Summary: North Gloucestarshire	48

CHAPTER 5 Continued

	Paragraphs
MONMOUTHSHIRE-ROSS	49–76
Development Plans	49–53
The longer term	54–76
South Monmouthshire	54–67
North Monmouthshire	68–73
The Wye Basin	74
Summary: Monmouthshire-Ross	75–76
SUMMARY: TOTAL CAPACITY FOR CHANGE WITHIN THE STUDY AREA	77–78

	Page
ANNEX 5A DEFINITIONS OF AREAS USED IN THE TABLES	55

	Paragraphs
CHAPTER 6 THE PHYSICAL PLANNING ALTERNATIVES	6.1– 6.36
INTRODUCTION	1– 3
ADHERENCE TO DEVELOPMENT PLAN CONCEPTS	4– 8
A DISPERSED NEW TOWNS STRATEGY	9–13
THE DEVELOPMENT OF URBAN SUB-REGIONS	14–27
Bristol	16–18
North Gloucestershire	19–22
Newport-Cwmbran-Pontypool	23–25
Summary: all urban sub-regions	26–27
THE ESTUARY	28–30
TOWARDS A PREFERRED SOLUTION	31–36

	Paragraphs
CHAPTER 7 THE PRESENT ECONOMY OF SEVERNSIDE	7.1– 7.80
INTRODUCTION	1– 2
THE GENERAL PICTURE	3– 7
POPULATION	8–11
EMPLOYMENT	12–14
EARNINGS AND INCOMES	15
TRAVEL-TO-WORK	16
SELF-EMPLOYED	17
OCCUPATIONAL STRUCTURE	18
THE MOVEMENT OF MANUFACTURING INDUSTRY TO SEVERNSIDE	19–24
TRADE FLOWS	25–30
NET OUTPUT	31–35
BRISTOL-BATH	36–50
The 1968 situation	36–43
Changes 1952-68	44–49
Recent trends and prospects	50
NORTH GLOUCESTERSHIRE	51–65
The 1968 situation	51–59
Changes 1952-68	60–64
Recent trends and prospects	65
MONMOUTHSHIRE-ROSS	66–79
The 1968 situation	66–72
Changes 1952-68	73–77
Recent trends and prospects	78–79
CONCLUSIONS	80

		Paragraphs
CHAPTER 8	ECONOMIC DEVELOPMENT TO 1976	8.1– 8.65
	INTROOUCTION	1– 9
	1976 FORECASTS	10–15
	National forecasts	10–12
	Severnside employment	13–15
	SECTOR FORECASTS TO 1976	16–48
	Agriculture	16–19
	Iron and steel	20–24
	Aircraft	25–32
	Other manufacturing industry	33–36
	The power industries	37–41
	Construction	42–43
	Ports	44–47
	Service industry	48
	OEVELOPMENTS IN THE SUB-AREAS	49–59
	Bristol-Bath	50–52
	North Gloucestershire	53–54
	Monmouthshire-Ross	55–59
	COMPARISON OF LABOUR OEMANO ANO LABOUR SUPPLY	60–62
	CONCLUSIONS	63–65

		Page
ANNEX 8A	NOTE ON EMPLOYMENT FORECASTS	131

		Paragraphs
CHAPTER 9	PROSPECTS FOR SEVERNSIDE AFTER 1976	9.1– 9.41
	THE NATIONAL BACKGROUND	1– 9
	PROJECTIONS FOR SEVERNSIDE	10
	PROSPECTS FOR TREND GROWTH	11–22
	Bristol-Bath	12–13
	North Gloucestershire	14–15
	Monmouthshire-Ross	16
	Overall comparison of labour supply and demand	17–18
	Summary—projections to 1991	19–21
	Projections to 2001	22
	PROSPECTS OF ACCELERATED GROWTH	23–39
	Idc policy	24–25
	Other inducements	26–31
	Population	32–35
	Organisational problems	36–39
	CONCLUSIONS	40–41

		Page
ANNEX 9A	NOTE ON POPULATION PROJECTIONS	156
ANNEX 9B	NOTE ON EMPLOYEE IN EMPLOYMENT PROJECTIONS	157
ANNEX 9C	NOTE ON THE CALCULATION OF EFFECTS OF ACCELERATED GROWTH ON EMPLOYEES IN EMPLOYMENT	158

	Paragraphs
CHAPTER 10 ASSESSMENT OF COSTS	10.1–10.31
INTRODUCTION	1– 9
DEVELOPMENT COSTS FOR SEVERNSIDE	10–23
Construction costs	11
Public utilities	12
Water supply	13
Postal services	14–15
Electricity and gas	16–17
The estuary	18–19
The value of land	20–23
COSTS OF ASSISTANCE TO INDUSTRY	24–28
OPERATING COSTS	29–30
SUMMARY OF OIFFERENTIAL COSTS	31

Tables in the text

		Page
4a	Study Area: population in built-up areas 1966	22
4b	Main urban areas: estimated retail sales	23
4c	Main central areas: hypothetical durable goods sales 1966	24
4d	Economic survey area (part): employment in commercial and business services and entertainment 1966	24
4e	Economic survey area (part): employment distribution 1966	25
4f	Main urban areas: journey-to-work 1966	25
4g	Study Area: housing stock 1966	27
5a	Bristol-Bath: estimated capacities of selected developable areas	46
6b	North Gloucestershire: estimated capacities of selected developable areas	49
5c	Monmouthshire-Ross: estimated capacities of selected developable areas	53
5d	Study Area: estimated physical capacity for additional population	54
6a	Study Area: estimated capacities within an 'urban sub-region' strategy	59
7a	Study Area and Great Britain: civilian population changes 1951-66	63
7b	Study Area: civilian population changes 1931-51	64
7c	Study Area and Great Britain: civilian population changes 1951-68	64
7d	Study Area and Great Britain: age/sex distribution of population 1951, 1961 and 1966	65
7e	Study Area: age distribution of migrants and residents 1966	65
7f	Sub-areas: average annual migration 1961-66	65
7g	Five-year migration to and from aub-areas of the Study Area and other areas 1961-66	66

TABLES IN TEXT Continued

		Page
7h	Study Area and Great Britain: percentage distribution of employees in employment 1968	68
7i	Study Area and Great Britain: unfilled vacancies 1961-68	68
7j	Study Area and Great Britain: wholly unemployed 1951-69	68
7k	Study Area and Great Britain: percentage changes of population aged 15 and over and total employees 1951-66	69
7l	Study Area and Great Britain: activity rates 1951 and 1966	69
7m	Wales, the South West and South East Regions: average earnings of individuals relative to Great Britain	73
7n	Study Area: net travel-to-work flows 1961 and 1966	74
7o	Study Area and England and Wales: travel-to-work flows 1966	74
7p	Study Area and England and Wales: self-employed 1951 and 1966	74
7q	Study Area and Great Britain: occupational structure 1966	75
7r	Study Area and United Kingdom: inward moves 1945-65	76
7s	Movement of industry to the Study Area 1966-68	77
7t	Study Area and United Kingdom: manufacturing employment arising from inward moves 1945-65	77
7u	Study Area: manufacturing and quarrying: purchases of raw materials and intermediate goods 1966	78
7v	Study Area: manufacturing and quarrying: total sales 1966	78
7w	Study Area: manufacturing and quarrying: final demand goods 1966	80
7x	Study Area: manufacturing and quarrying: materials used in production: sales and net output 1966	81
7y	Study Area and United Kingdom: net output per employee in 1966 by area and type of business	81
8a	Study Area and Great Britain: civilian population changes 1966-76	119
8b	Study Area and Great Britain: age/sex distribution of civilian population 1976	120

TABLES IN TEXT Continued

		Page
8c	Great Britain: employees in employment 1968 and 1976	121
8d	Study Area: employees in employment 1968 and 1976	121
8e	Sub-areas: employees in employment 1976	126
8f	Sub-areas: employees in employment 1968 and 1976	128
8g	Study Area and Great Britain: population aged 15 and over 1968 and 1976	129
8h	Study Area and Great Britain: projected activity rates 1976	129
8i	Study Area: employees in employment 1976	130
9a	Study Area and Great Britain: civilian population 1968-2001	148
9b	Study Area and Great Britain: civilian population aged 15 and over 1976 and 1991	148
9c	Great Britain: employees in employment 1976 and 1991	149
9d	Study Area: employees in employment 1976-2001	149
9e	Bristol-Bath: employees in employment 1976 and 1991	150
9f	North Gloucestershire: employees in employment 1976 and 1991	150
9g	Monmouthshire-Ross: employees in employment 1978 and 1991	150
9h	Study Area and Great Britain: projected activity rates 1991	151
9i	Study Area: population assumptions for planning purposes assuming no new stimulus to growth	152
9j	Study Area: likely population levels on present policies at about the year 2001	152
9k	East Severnside: assumed employment structure for the increment resulting from accelerated growth	154
9l	East Severnside: additional employees in employment from maximum accelerated growth 1981-1991-2001	154
9m	East Severnside: population increase due to accelerated growth 1981-2001	154
9n	Study Area: maximum population 1991 and 2001	154

Figures in the text

		Page
No. 3	Migration to and from the sub-areas 1961-66	67
4	Sub-areas: percentage employment in major sectors 1952-68	70
5a	Sub-areas as a percentage of Great Britain manufacturing employees in employment 1952-68	71
5b	Sub-areas as a percentage of Great Britain employees in employment in services per 1,000 population 1952-68	71
6	Sub-areas and Great Britain: unemployment rates 1951-69	72
7	Sub-areas and Great Britain: employees in employment as a percentage of population 1952-68	72
8	Trade flows 1966	79
9a	Study Area: employees in employment—1968 and 1976	122
9b	Study Area: employees in employment—1968 and 1976—comparison with Great Britain	122
10	Sub-areas: employment forecasts 1976	127

Tables in Annexes 7A and 8b

		Page
7A.1	Great Britain—total: employees in employment 1952-68	89
7A.2	Great Britain—males: employees in employment 1952-68	90
7A.3	Great Britain—females: employees in employment 1952-68	91
7A.4	Study Area—total: employees in employment 1952-68	92
7A.5	Study Area—males: employees in employment 1952-68	93
7A.6	Study Area—females: employees in employment 1952-68	94
7A.7	Bristol-Bath—total: employees in employment 1952-68	95
7A.8	Bristol-Bath—males: employees in employment 1952-68	96

TABLES IN THE ANNEXES Continued

		Page
7A.9	Bristol-Bath—females: employees in employment 1952-68	97
7A.10	North Gloucestershire—total: employees in employment 1952-68	98
7A.11	North Gloucestershire—males: employaes in employment 1952-68	99
7A.12	North Gloucestershire—females: employees in employment 1952-68	100
7A.13	Monmouthshire-Ross—total: employees in employment 1952-68	101
7A.14	Monmouthshire-Ross—males: employees in employment 1952-68	102
7A.15	Monmouthshire-Ross—females: employees in employment 1952-68	103
7A.16	Great Britain—total: employees in employment 1952-68: analysis of change	104
7A.17	Great Britain—males: employees in employment 1952-68: analysis of change	105
7A.18	Great Britain—females: employees in employment 1952-68: analysis of change	106
7A.19	Study Area—total: employees in employment 1952-1988: analysis of change	107
7A.20	Study Area—males: employees in employment 1952-68: analysis of change	108
7A.21	Study Area— females: employees in employment 1952-68: analysis of change	109
7A.22	Bristol-Bath—total: employees in employment 1952-68: analysis of change	110
7A.23	Bristol-Bath—males: employees in employment 1952-88: analysis of change	111
7A.24	Bristol-Bath—females: employees in employment 1952-68: analysie of change	112
7A.25	North Gloucestershire—total: employees in employment 1952-68: analysis of change	113
7A.26	North Gloucestarshire—males: employees in employment 1952-68: analysis of change	114
7A.27	North Gloucestershire—females: employees in employment 1952-68: analysis of change	115

TABLES IN THE ANNEXES Continued

		Page
7A.28	Monmouthshire-Ross—total: employees in employment 1952-68: analysis of change	116
7A.29	Monmouthshire-Ross—meles: employees in employment 1952-68: analysis of chenge	117
7A.30	Monmouthshire-Ross—females: employees in employment 1952-68: analysis of change	118
8B.1	Great Britain—total: employees in employment 1968-76	132
8B.2	Great Britain—males: employees in employment 1968-76	133
8B.3	Greet Britain—females: employees in employment 1968-76	134
8B.4	Study Area—total: employees in employment 1968-76	135
8B.5	Study Area—males: employees in employment 1968-76	136
8B.6	Study Area—females: employees in employment 1968-76	137
8B.7	Bristol-Bath—totel: employees in employment 1968-78	138
8B.8	Bristol-Bath—males: employees in employment 1968-76	139
8B.9	Bristol-Bath—females: employees in employment 1968-76	140
8B.10	North Gloucestershire—total: employees in employment 1968-78	141
8B.11	North Gloucestershire—males: employees in employment 1968-76	142
8B.12	North Gloucestershire—females: employees in employment 1968-76	143
8B.13	Monmouthshire-Ross—total: employees in employment 1968-76	144
8B.14	Monmouthshire-Ross—males: employees in employment 1968-76	145
8B.15	Monmouthshire-Ross—females: employees in employment 1968-76	146

Index 165

Maps

	Map
General Reference Map (see inside back cover)	
Statistical zones	1
Population of built-up areas 1966	2
Journey-to-work 1966	3
Civilian population change 1951–1966	4
Rail transport 1970	5
Topography	6
Agricultural land classification	7
Geology and minerals	8
Countryside conservation	9
Nature conservation	10
Drainage	11
Severn estuary	12
Power 1970	13
Selected areas of search	14
Summary of development plans 1968: Bristol-Bath	15
Development opportunities: Bristol-Bath	16
Summary of development plans 1968: North Gloucestershire	17
Development opportunities: North Gloucestershire	18
Summary of development plans 1968: Monmouthshire-Ross	19
Development opportunities: Monmouthshire-Ross	20
Development opportunities: summery	21

1 THE STUDY

The task

1.1. At tha beginning of the last century a fifth of Britain's population lived in the towns. Nowadays more than four-fifths do so and the proportion is still increasing. Many of those towns grew up to meet needs very different from those of today and people everywhere now expect higher environmental standards than were often provided in the past, and greater opportunities for movement. Redevelopment of older residentiel areas tends to be at a lower density, causing overspill requirements, while schools, factories, hospitals and shops have to be built to higher standards of space. Recreation and the car call for even more land. Thus, urban renewal end restructuring alone require additional urban land and major planning efforts over wide areas.

1.2. The rapid rise that took place in the number of births in the late 1950s means an inevitable corresponding rise in the number of families in the late 1970s and in total numbers thereafter as these families in turn have children. The present estimate is that the population of Great Britain will increase by around a fifth by the end of the century, to a total of over 64 million. Revised estimates of future birth rates may bring this figura down somewhat but the total population increase during the remainder of this century is inevitably going to be large and very much larger than that of the pest thirty years.

1.3. Ona effect of this increase will be rising demands for homes and jobs, demands that will not necessarily arise in the present population locations. In the past, although gross migration flows have been high, net flows from one region of the country to another have tended roughly to balance out so that the national settlement pattern has changed only very slowly. In the future, however, it is possible that people will move home more frequently and over longer distances and these movements will not always balance out. New types of employment may arise altering further the patterns of labour demand and possibly accelerating differences in the rate of development in different parts of the country.

1.4. Meeting both higher demands from the existing level of population and the needs of additional population will involve major planning issues at national, regional and local levels. Some areas may become so congested as to give rise to major social costs and to make it impossibla to provide for the individual tha environment and the opportunities he wants. Others may lose population so rapidly as to leave behind underused facilities and an air of decline, while in yet others excellent opportunities for growth may not be exploited.

1.5. Severnside was identifiad as an area possibly falling into the third catagory. Located on one of the country's great estuaries, its population had been growing rapidly without serious signs of congestion, and it appeared to have potential for accommodating much larger numbers of people and industry. Against this background we regarded our primary task as that of assessing tha Study Area's capacity for change and growth up to the end of the century. We did this on the basis of both its physical possibilities and its economic prospects so far as we could judge them. We have recorded in detail our views on what are physically the best building areas and have identified a number of planning options on which plans and development programmes could be based. We hope that in consequence this Study will help:

i central Government to decide whether to accelerate growth, and if so when, in the Study Area;

ii tha formulation of regional and sub-regional strategies;

iii local planning authorities within the Study Area to draw up their own structure plans.

1.6. Wa have assumed throughout that the next stages, after public discussion of our report, will be consideration of our findings by central and local government and regional bodies, followed by the mora detailed preparation of local plans on the basis of what are then agreed to be the best assumptions about population end economic growth in the Area.

The area

1.7. 'Severnside' is a vague geographical term, and the Unit did not have the resources to range over the area covered by the widest possible interpretation of it. Even so the area we studied consisted of some 2,200 square miles, lying on both sides of the estuary. We had to extend our economic analysis even further, to areas on the fringe of the Study Area. These 'fringe areas' and the Study Area are together known as the Economic Survey Area and shown on the General Reference Map and in Figure 1. For certain statistical purposes, the area was divided into over a hundred zones. These are shown in Map 1. Except where otherwise indicated, however, this report deals solaly with the Study Area.

1.8. The total population of the Area was 1·7 million in 1968, with almost 1 million concentrated in the three urban areas of Bristol-Bath, Gloucester-Cheltenham and Newport-Cwmbran-Pontypool. Our analysis showed that these three areas with their hinterlands formed distinct physical and economic sub-areas. We have, therefore examined each of these sub-ereas individually and much of our report will deal with their respective prospects and problems. They have been called in this report 'Bristol-Bath', 'North Gloucestershire' and 'Monmouthshire-Ross' and are shown in terms of local authority boundaries in Figure 1. They correspond so far as the first two are concerned with the Bristol-Severnside and North Gloucestershire sub-divisions of the South West standard region. The third sub-area consists of part of the Coastal subdivision of South Wales and a small part of Herefordshire (Ross-on-Wye UD and Ross and Whitchurch RD).

1.9. For convenience Bristol-Bath and North Gloucestershire are on occasion jointly referred to as East Severnside and Monmouthshire-Ross as West Severnside, although, in fact, part of the North Gloucestershire sub-area lies west of the Severn.

Time scales

1.10. It has become customary to discuss broad population distribution problems in terms of population levels by the end of the century and for purposes of comparison we have presented our own conclusions in similar terms. Thirty years is, however, much too far ahead for any sort of quantitative physical planning or economic analysis and in the course of our work we have taken as key dates the following: 1976, which is the furthest ahaad we have attempted detailed economic forecasting; 1981, as the main date to which much planning work is currently directed; and 1991, as the most suitable terminal date for long-term forward planning and broad economic projections (para. 3.2).[1]

(1) Because the latest Census figurss when we were prepering the Study were those compiled in 1966 many of our Tebles and statistics were based on them. In other places we were able to obtain and use more recent figures such as those relating to employment published in 1969 by the Department of Employment and Productivity.

The method

The physical approach

1.11. An area of 2,200 square miles if heavily urbanised throughout could in theory accommodate far more then the total estimated increase of national population to tha year 2000, but such a heavy concentration would bring about the problems of congestion in this area which it is part of the object of our Study to help solve elsewhere. We found in any case that Severnside is subject to considerable limitations on population location because of such factors as steep hillsides and marshy areas, which would make urban development expensive, and areas of outstanding natural beauty where urbanisation would involve serious social costs. Also to be taken into consideration are man-mada constraints, such as the safety areas for nuclear power plants. We therefore applied a series of broad sieves to the Area in order to eliminate locations *prima facie* not suitable and concentrated our attention on 'areas of aearch' relatively free of major constraints on development (Chapter 4).

1.12. A positive approach was then made to these areas to identify substantial sites for urban development (Chapter 5). Since we wented to consider the Area's potential capacity for a population increase big enough to make a significant contribution to dealing with the national population problem we looked primarily for sites each capable of supporting at least 50,000 people. We also included, however, smaller sites on the fringes of existing towns, where development could be related to the growth of the main urban areas. It was not part of the Unit's task to plan these sites in detail, but we did satisfy ourselves that there were possibilities for creating towns of good design with adequate amenities and that it was physically practicable to provide them with roads and aewerage without excessive costs. Each of the three sub-areas was then considered in the light of the

County Borough	BATH
Municipal Borough	Wells
Urban District	Portishead
Rural District	Long Ashton

Boundaries as at 1 4 1966

MILES 10 0 10 20 30

KILOMETRES 10 0 10 20 30 40

FIGURE 1 DEFINITION OF AREAS

broad types of development which the selected sites appeared to offer and the various main physical planning options thus elucidated (Chapter 6).

1.13. At the time we started our work, we could not find a transportation model which seemed likely to produce satisfactory results over the whole of our particular type of area with its several main centres and scattered alternative locations for population. We therefore welcomed the land-use/transportation studies which were put in hand by the local highway and planning authorities in Monmouthshire and North Gloucestershire, since we felt these should help to provide a suitable means of evaluating in due course the options identified by our general physical and economic feesibility studies. We did, however, examine the possible usefulness of a shopping model in assessing the implications for retail distribution that could arise from the developments we have in mind.

The economic approach

1.14. Our complementary exercise to determine the economic potentialities of Severnside required an analysis of the present economy of the various parts of the Area in order to identify their strengths and weaknesses (Chapter 7). It seemed likely that the general tendency for vigorous growth seen in the past would continue. Consequently population projections were prepared, based on the assumption that the past net inward migration movement would continue, and detailed employment forecasts to 1976 were then compared with the resulting likely labour supply (Chapter 8). We then projected these growth rates forward to give a broad indication of the way employment and population might increase in the Area on two different assumptions—first that no new efforts to stimulate the inward movement of industry and population were made and secondly that vigorous efforts were made to stimulate growth (Chapter 9). We attempted also to discover whether there were any marked differences between the likely costs of development in the Area and those which might be incurred by similar growth in alternative locations (Chapter 10).

Synthesis

1.15. The final stage involved an overall assessment of the physical and economic analyses. In practice the work had been interwoven at all stages. For example it was accepted that the elimination of large parts of the Area as unsuitable on grounds of certain constraints involved implicit economic judgements that these areas would give rise to such costs or diseconomies that urban development would be too expensive compared with other possibilities either in the Area or elsewhere. Ideally such economic judgements should be made explicitly. But quite apart from the fact that the Unit had nowhere near sufficient resources to analyse such issues for such a large area, operational models are not yet available for costing and comparing urban development on different sites—particularly when subjective issues such as the impact on land of outstanding natural beauty are concerned.

1.16. The main synthesis we have attempted is to bring together the broad strategic physical options in the Area with the economic possibilities and thus set out what would appear to be, sub-area by sub-area, the main practical options which seem to lie open in the coming years and to give an idea of some at least of the costs and benefits involved. We have also brought together material on which a comparison of this Area with others might be based. Our conclusions are given in Chapter 2, with the more detailed analysis in Part 2 of the Report.

2 CONCLUSIONS

The area's potentialities

2.1. Severnside was chosen for study for a number of reasons. Economically, it grew rapidly throughout the 1950s with few signs of serious congestion. Geographically, it is some way to one side of the present concentration of urban growth in England, which stratches from South Lancashire to London, and yet parts of the Area are almost as close as are some exlsting major new towns to Birmingham and London and its communications and economic links with these centres are good. If it should be considered that the congestion and other planning problems of any part of the two major agglomerations call for large-scale development elsewhere, Severnside is clearly well placed as one possibility. Whatever may be the road, rail and other communication developments of the future, Savarnside is so placed that it must become an increasingly important node of the national communications pattern (paras. 4.20-4.40). The Severn estuary, in addition to important port facilities, provides plentiful water for cooling purposes and has substantial areas of flat land along its banks. There are also interesting possibilities, which our own proposals would not endanger, for barrages, Maritime Industrial Development Areas and major airports although we felt that these wera unlikely to be developed, if at all, in a way which would appreciably affect economic growth in the 1970s and 1980s (paras. 4.85-4.88).

2.2. In terms of physical environment the Area has a mild climate, generally a moderate rainfall, and contains some of the most attractive countryside in England and Wales (paras. 4.41 and 4.63-4.70). The beauty of the landscape, the historic towns and the accessibility of good shopping facilities and major tourist and holiday attractions make it a very pleasant and convenient place to live and have undoubtedly been factors in the rapid inflow of population.

2.3. The population growth of the Area over the period 1951-66 was 15·4 per cent which was considerably greater than the Great Britain growth of 9·4 per cent. The difference was almost wholly due to the net inward migration which constituted 46 per cent of total change over the period (para. 7.8). We have examined what would happen to the Area's population if the net inward migration of the period 1951-66 were to continue unchanged into the future. The resulting population figures are given in Table 2a. This growth in population would add 650,000 to the Area between 1968 and 2001 (para. 9.22). We set up these particular projections to provide figures against which the economic growth potential of the Area might be tested and the possibilities of even greater growth assessed. For convenience we have termed this 'trend' growth, as against the 'accelerated' growth that new maasures in the Area might stimulate.

Table 2a

Study Area: population estimates on basis of past migration trends 1968-2001 *

'000

Area	1968	1981	1991	2001	Total growth 1968-2001	
						%
Study Area	**1,650**	**1,900**	**2,100**	**2,300**	**650**	**40**
Bristol-Bath	900	1,000	1,100	1,200	300	35
North Gloucestershire	450	550	600	650	200	40
Monmouthshire-Ross	300	350	400	450	150	53

* Figures in this Table have been rounded to 50,000 whereas the percenteges quoted are based on the unrounded figures.

2.4. Total employment in the Area has similerly grown rapidly at rates well above those in most regions and the country as a whole. On East Severnside the growth has largely been self-generated since few new firms have been allowed to build premises there, but West Severnside growth has been partly due to inward industrial movements (paras. 7.19-7.24). The Area has overall a broadly-based economic structure, but special features are the large aerospace industry in Bristol-Bath (para. 7.4), the high level of mechanical and instrument engineering in North Gloucestershire (para. 7.5) and iron and steel in Monmouthshire-Ross (para. 7.6).

2.5. Our forecast of the likely economic growth in the Area to 1976 indicates that if the population does grow at the trend rate set out in Table 2a there should be sufficient employment available in all three sub-areas to keep unemployment low and activity rates high. Parts of the Aree may suffer temporary setbacks (paras. 8.63 and 8.65). For example, the future of the aerospace industry is particularly sensitive to Government decisions: the Bristol factories are part of a national complex and in consequence their work load and employment levels cannot be considered in isolation.

The industry is very dependent on Government support, which can be affected by a whole complex of differing factors with the result that programmes are subject to change and employment levels are affected. The abandonment of the Concorde project might set growth back in the Bristol area by some years, though the upward trend would we believe be resumed. On the other hand we may even have under-estimated growth, for example in North Gloucestershire in view of its proximity to the West Midlands. Soma of the past economic growth in the Monmouthshire area was due to the efforts of the Cwmbran New Town Corporation and future growth will be slower unless similar efforts ara continued (para. 9.16).

2.6. Altogether we have reached the broad conclusion that, assuming measures are not taken to stimulate growth in this Area so that its treatment in relation to the rest of the country remains comparable with what it was in the 1950s and 1960s, net inward migration is likely to be on the same scale as during that period, i.e. 6,000-7,000 persons a year—provided the necessary accommodation is made available. The population levels which would be reached would be of the order given in Table 2a. Even in the unlikely event of a persistent decline in net inward migration, natural growth alone could, over a somewhat longer term, bring about this scale of growth. Active measures of restraint would be needed to hold the population of this thriving area significantly below theae levels and although there are planning problems, which are discussed below, we could see no economic grounds for imposing such restrictions.

2.7. These figures ara based on the hypothesis that in future industry on the move would be broadly distributed about the country in the same way as it has in the recent past. The national redistribution of population growth which we are considering must, however, imply a willingness to change the distribution of industry as well. We have therefore examined the national and local possibilities for such a change. Nationally tha needs of the Development and Intermediate Areas and the existing new and expanded towns are such that it would be unwise to assume that the prospects of a major new shift in the distribution of industry are very great during the 1970s. We have therefore assumed that no attempt to accelerate present growth rates in any part of Severnside would be made before 1981 (para. 9.4). After that date howaver, bearing in mind that many of the existing naw and expanded town schemes will have reached their present population targets, there should be scope for arrangements by which new ideas on the distribution of population could be made effective by new distributions of industry. If after 1981 Idc's[2] were to be mada freely available to local and incoming firms on East Severnside this would in itself lead to substantial industrial growth above past trends. (Idc's are already freely available on West Severnside.) In addition an announcement that the Area had been chosen for major growth and that tha provision of houses and other infrastructure for incoming industry and

(2) Industrial development certificates issued under the Town and Country Planning Act 1962. An Idc is needed to support applications for planning permission for creation of new industrial floor-space above certain specified limits.

Table 2b

Study Area: population estimates on basis of accelerated growth 1968-2001 *

'000

Area	1968	1981†	1991	2001	Total growth 1968-2001
					%
Study Area	**1,650**	**1,900**	**2,250**	**2,650**	**1,000**	**60**
Bristol-Bath	900	1,000	1,200	1,350	450	50
North Gloucestershire	450	550	700	850	400	84
Monmouthshire-Ross	300	350	400	450	150	53

* Figures in this Table have been rounded to 50,000 whereas the percentages quoted are based on the unrounded figures.
† Date from which accelerated growth might take place.

peopla would be provided would have a further major stimulating effect. We have concluded that if maximum efforts were made to stimulate growth on Severnside (excluding financial inducements to industry to move there) the population levels which might be achieved are broadly those given in Table 2b above (para. 9.41). The detailed implications of these growth prospects have, however, to be considered in the light of the physical planning options for the land available in various parts of the Area.

2.8. Severnsida has a substantial supply of physically davelopable land. We identified 14 major sites able to take large-scale development (see Map 21), in some cases of up to a quarter of a million people. Taking, together with the capacities of these sites, the current land-use planning provisions plus a reasonable provision for the capacity of other smaller areas, we consider it would be possibla to design towns and cities pleasant to live and work in for a total population of up to 3·4 million people, i.e. double the present number. There would come a point whera over-urbanisation would create congestion, threaten encroachment on attractive countryside, placa serious strains on the natural environment and bring increased costs as more difficult sites had to be brought into development. It is impossible to identify this point pracisely, but the problem should not seriously arise at the leval of 3·4 million (see Chapter 5).

2.9. Within this broad total, which would involve using all the major sites we have identified, there are a numbar of planning options (see Chapter 6) covering the degree and form of development in different parts of the Area. We hava grouped the possibilities into three broad types:

i strict adherence to the concepts of the present development plans (paras. 6.4-6.8);

ii as in i for existing urban areas, but with introduction of large new towns in rural areas well away from existing large towns (paras. 6.9-6.13);

iii major expansions of, and near to, the main urban areas of Bristol, Gloucestar and Newport (paras. 6.14-6.27).

2.10. The total population potential under a type i approach is limited and if planning continuas on this basis the Area will, in the not very distant future, be faced with shortage of land for building

and problems of allocating more land, or of arranging the overspill of population out of the Area will arise. Courses ii and iii, the latter involving some adjustment to present green belts, are those which provide the prospects of accommodating substantially greater populations in the Study Area. These various options ere best considered by each sub-area separately in the light of the economic potential of each.

Bristol-Bath

2.11. The economy of this sub-area is soundly based with substantial growth prospects for both the existing manufacturing industries and the services it provides as an important regional centre. Population growth is expected to continue at the past average level of 9,000-10,000 a year to the end of the century if the treatment of this area remains broadly unchanged, which would involve little inward movement of mobile industry. Though work on Concorde is important in this area, even if that comes to an end the check to growth should be only temporary (para. 7.4). If in addition new efforts were made to stimulate growth in this area (but without financial incentives to attract industry) and the necessary accommodation and infrastructure were made available, net inward movement of people might be trebled to around 10,000 a year, giving e total increase, with natural growth, of about 450,000 over the period 1968-2001.

2.12. The physical capacity of the Bristol-Bath sub-aree is however limited unless there are to be substantial inroads into areas of outstanding natural beauty and other ettractive countryside and excessive growth of attractive villages and towns. Weston-super-Mare and that part of Somerset within our Study Area provided no areas suitable for large-scale urban development (para. 5.30) and although the population of Bath will no doubt continue to grow, its special architectural and historical character excludes it from consideration as e sita for major development (para. 5.32).

2.13. We heve in fact found that, taking these limitations into account, the only sites suitable for major development in this sub-area are concentrated to the north-east of Bristol in the locality we have called 'Frempton Cotterell'. Development here, which could accommodate ovar 300,000 people, would be intimately inter-connected with Bristol itself for the physical planning of the transport, shopping and other urban systems. It would elso be abla to take full advantage, in a way no other site could, of the economic growth potentiel of Bristol arising from the inherent growth of Bristol firms and the ettractiveness to other firms of Bristol's commercial facilities and pool of skilled labour.

2.14. This development would however involve the realignment of this part of Bristol's approved green belt since the greater part of the developmant has to be in the green belt rether than on the far side of it to avoid encroaching on the more attractive countryside in thet direction. Thus en important choice has to be mede between continuing to contain Bristol within its prasent green belt or making this mejor adjustment. The relatively minor and scattered developments which would be possible in the Bristol sub-area without this change would not accommodata, on a satisfactory planning besis, the expected growth of populetion for very long. Outlets for the housing pressures which would thus develop would be sought in all parts of the green belt as well as in the attractive countryside beyond it and the surrounding villages and towns. If these were successfully resisted then in the end substantiel numbers would have no choice but to move out of the area altogether. Industrial growth would be slowed down by labour shortages and might have to be formally restrained—a course which seems to us undesirable on economic grounds. Bristol's growth as e regional centre would also suffer.

2.15. On the other hand, major development of Bristol presents complex problems which would be a major challenge to local planners. Realignment of the green belt might reduce the eccessibility of the countryside in some directions for parts of the present built-up area and the attractive countryside beyond the new development would certainly have to be formally protected from further encroachment. The transport system of the totel urban area would have to be designed in conjunction with a reorganisetion of the present structure and e full transportation study is needed to provide the necessary basis. The location of employment opportunities would need cereful planning and new service fecilities including a big and expensive drainage scheme would be needed. If it is to take place a start should be made soon on design work, and development opportunities meanwhile safe-guarded, so an early decision is needed on whether Bristol is to be expanded in this major way or whether the constraint of the present green belt is to be retained.

2.16. If it is eventually decided to extend Bristol, the housing land made available together with the expansion still possible under present development plans and some other increeses e.g. et Weston-super-Mare, would give a total additional population capacity for the sub-area of about 500,000 (para. 6.17). This would cater for trend rate of growth of population, which would include a net inward movement of about 3,000 people a yeer, until well into the next century.

2.17. If, however, efforts were made to stimulate growth in this sub-area the increase of 450,000 people by 2001 would be close to our estimete of the area's ultimate capacity for growth even allowing for the substantial enlargement of Bristol. Once that capacity was used up the pressures on the erea referred to in para. 2.14 would inevitably become a problem; thus accelerated movement inwards during the 1980s and 1990s could bring substantially nearer the time when outward movement became necessery. In sum, if Bristol's green belt is maintained in its present form, this part of the Study Area is virtually ruled out as a major growth zone; but with the suggested realignment of the green belt boundary, the options lie between trend growth of around 200,000 by 1991, going on at the same rata to 300,000 by 2001 and accelerated growth of 300,000 by 1991 going on to 450,000 by 2001 (Table 2c).

North Gloucestershire

2.18. This sub-area is undoubtedly attractive to people and industry. Close to the West Midlands conurbation, it has the advantage of being well placed on the national communicetions network. Average growth of manufacturing industry over the past has been markedly high. We

expect that even without efforts to encourage growth thera will be a net inward movement of 2,000 people a year between 1968 and 2001. If growth is encouraged there is the economic potential in this area, we believe, to support inward movement of about 12,000 people a year over the period 1981-2001 and thus double the total expected trend rate of growth in the sub-area to 400,000 for the period 1968-2001. If the substantial growth of Bristol referred to in para. 2.13 is not adopted, part of this expansion could be based on people and industry overflowing from the Bristol-Bath area.

2.19. Wa have identified major sites in this area which would be capable of accommodating nearly 500,000 people, mostly within a few miles of Gloucester, and there is substantial additional capacity at Dymock somewhat furthar away. But a number of planning problems present themselves. There is the naed to conserve the special character of Cheltenham and its independence from Gloucester, from which it is at present separated by a statutorily defined green belt. There are problems of coping with the important communication routes which cross the area and of surface-water drainage. Moreover, by 1981 the population growth of about 5,000 a year will have used up practically the total capacity allowed for in existing development plans. Although further growth is possible on the east side of the Severn, especially if eome land at present in the green belt can be developed, use will have to be made at eome time after 1981 of the major new sites on tha west bank. The only alternatives would be to curtail the area's natural growth tendencies or to expand Cheltenham or to ancroach on areas of landscape importanca and those which are liable to flooding and expensive to develop (paras. 6.19-6.22).

2.20. The precise date when such a move will become essential will depend upon population growth rates and the extent to which it is found practicable and desirable to use up the last bit of capacity on the east bank. However, with the growth rates which we anticipate will occur in this area even without any stimulus, this time must come in the 1990s and with accelerated growth it could be in the 1980s. We consider, therefore, that if planning for the araa is to be done efficiently in tha context of long-term growth, the decision in principle to develop on the west side of the river should be taken now so that this becomes an element in any forward planning of the area.

2.21. Major development on the west bank will involve substantial initial investment in infrastructure (though the actual river crossing would not be costly). It will raise a number of questions such as whether the new developments are to be planned from the start as independent towns or as suburbs of Gloucester based on patterns capable of evolving into separate communities. Ultimately, these developments could be very large, but initially they would probably look for at least some employment and service facilities to Gloucester only a few miles away and firms would be attracted to the area by the labour pool and the facilities at Gloucester. Growth on the west bank will, moreover, affect the planning of the redevelopment in the present City centre and the re-fashioning of the City's transport system. This all points to development on the west bank starting with the araa nearest to Gloucestar and leaving Dymock, the most remote site, to be used later if the sub-area grows very rapidly in the 1980s and 1990s. In the next century expansion further northwards towards Worcester is conceivable to take even more growth.

2.22. There is thus a strong case for what amounts to a cluster of four large towns—Cheltenham, Gloucester and two new areas west of the Severn. Within this structure there could be an expansion of Gloucester, including a northward growth at Down Hatherley possibly causing some modification of the existing green belt. We would envisage such an urban system set within a substantial new system of green belts covering, in particular, the banks of the Rivers Severn and Leadon and an area east of the M5 motorway and entirely encircling Cheltenham.

2.23. When development of the west bank areas doas start, with its substantial infrastructure expenditure, the best raturn would be obtained by a rapid initial build-up of population and employment. To do this an organisation with something like the power and financial resources of the present New Towns would be needed and with similar treatment in respect of idc's (para. 9.37). But tha very existence of such an organisation would inevitably stimulate the overall growth in the area above past trende. Thus it would appear that for local reasons alone some acceleration of growth in North Gloucestershire is likely to be desirable whenevar development on the west bank gets undar way. If, however, it was decided for national reasons to go all out for the maximum possible rate of growth in this sub-area, the organisation and the idc treatment needed would probably have to go beyond present ordinary new town arrangements.

2.24. An alternative option to achiave major growth would be to hold back the growth near Gloucester and develop Dymock at an early date. This would reduce the strain on Gloucester's infrastructure and on the road systems of the area. Dymock would moreover be well placed on the developing national motorway system. However, substantial quantities of high-grade agricultural land and areas of high landscape quality would be involved: it would be more difficult to attract the necessary industry and people to Dymock than to a site nearar Gloucester and the early provision of expensive central area facilities would be needed. Although not to be ruled out we rate this as a lower alternative to the westward growth of the Gloucester urban sub-region.

2.25. Thus there is a range of options for this area of growth of betwaen 150,000 and 250,000 by the year 1991 and between 200,000 and 400,000 by 2001. Various locations for this growth are possible, but we considar that development of the west bank of the Severn will be necessary whatever the population level chosen within these limits. This when it comes could be best organised by new town-type treatment which would in itself provida some stimulus to extra growth. We recommend an early decision that there will eventually be major population development on the west bank of the Severn and the beginning of the necessary planning work on both banks. But it should not be necessary to decide on the exact level of population growth to be planned for in this area for some years yat while the detailed investigation of possibilitias is being carried out. Meanwhile, plans which did not cut across long-term objectives could be made to deal with short and medium-term growth.

Monmouthshire-Ross

2.26. The Newport area has attracted large numbers from the Monmouthshire valleys. Employment has grown steadily and accommodation has been provided in Cwmbran New Town and by the local authorities in connection with the steelworks at Llanwern. Parts of the area have had Development Area status for some time, other parts have receivad Intermediate Area treatment since June 1969 which may well stimulate growth. On the other hand while the steel industry is likely to continue to prosper, the rapid growth in employment brought about in the past by the building of the Spencer Steelworks is unlikely to be repaated. In general, wa anticipate a continuation of substantial population growth in this area at about previous levels—this is based in part on the assumption that a stimulus to growth similar to that imparted by the New Town will be continued.

2.27. In the Newport area there is only one major site for development (pare. 5.64). This lies to the north of the town and its use would create what would be virtually a single urban sub-region from Pontypool to Newport. It would be suitable for new town-type development. In view of the shortage of other good sites in the area an early decision on this development is desirable. We see capacity problems arising on the M4 near Newport, where it serves both as a main urban distributor road and as the main motorway approach to industrial South Wales, so that it is important in any development to leave open the opportunities for an eventual duplication of this vital east-west route (para. 5.63).

2.28. The other sites we have identified in this sub-area are at Raglan (para. 5.69) and Caerwent (para. 5.61). There is capacity at Raglan for about a quarter of a million people on a large green field site which could be a major new development not related to any existing devalopment in the area. Its use would involve the loss of first-rate agricultural and high-quality amanity land; it might also incur high infrastructure (including drainage) costs and, for a major scheme, would need substantial amounts of mobile industry and probably financial inducements. It is lass well placed on the road network than Dymock. It would not contribute to the industrial restructuring of South Wales and if financial inducements were given to industry, might even hinder this. There seem no particular reasons for choosing it over many other green field sites in the country as a whole. We would not expect that development would be needed there anyway until some time in the 1990s at the earliest. There is also some capacity at Caerwent and development here may be necessary if there is a major industrial development on the Caldicot Level.

2.29. We thus find there is only one clear-cut immediate option and that is the development of the Newport-Cwmbran-Pontypool area. With associated growth elsewhere in the sub-area this would accommodate about 150,000 which is almost exactly the 'trend' growth of the population of the sub-area to about 2001 with a net inward movement of 1,750 people a year. It would be possible to achieve accelerated growth above trend in the Newport area by taking sites which we have rejected for urban development and encouraging major growth there with substantial infrastructure investment. This would however be costly. In our view there are almost certainly better sites to the west of the Study Area for the location of the growing population of South Wales. Thus we do not recommend growth above the trends which have prevailed in the past in the Newport-Cwmbran-Pontypool area (Table 2c).

The Area as a whole

2.30. The above analysis of the sub-areas showe that there is a range of planning options, but that growth up to 2001 could best be based largely on the three main towns in the Area, developing them into major urban sub-regions each embraced within a new and substantial green belt system. This concentration of growth has the important advantage of conserving large arees of attractive countryside and areas of agricultural importance. The main elements of the strategy are outlined in Figure 2, and in paras. 6.31-6.36. Although with improved communications the journey times between these main towns are dropping they will remain, even with the maximum developments we postulate, quite distinct from each other with their own local hierarchies of smaller towns and villages. Although, therefore, account will have to be taken in the planning of each sub-area of the broad strategies in the others, we see no need for any special overall planning authority to develop the Area as a whole. Indeed, so far as Monmouthshire is concerned it is much more important to co-ordinate its planning with the rest of industrial South Wales.

2.31. We have seen that although there are planning problems to be overcome, each sub-area has the physical capacity to cope with population growth as great as the maximum which we believe it would be practicable on economic grounds to stimulate in each sub-area by 2001, assuming no financial inducements to industry on East Severnside. Any lower figure could be accommodated but we have concluded that in none of the three sub-areas is it desirable on economic grounds to attempt to restrain growth below the trend rates set out in Table 2a. Table 2c summarises the range of population growth figures within which we believe the practical options for Severnside lie. Growth anywhere within these ranges would be appreciably higher than the estimated national growth of 12 per cent by 1991 and 20 per cent by 2001, and would represent a significant contribution to the national population location problem.

Table 2c

Study Area: range of population increases 1968-91 and 1968-2001 *

'000

Area	1968–1991		1968–2001	
	Range	%	Range	%
Study Area	**450-600**	**26-37**	**650-1,000**	**40-60**
Bristol-Bath	200-300	24-31	300 - 450	35-50
North Gloucestershire	150-250	27-48	200 - 400	40-84
Monmouthshire-Ross	100	34	150	53

* Ranges in this Table have been derived from those in Tables 2a and 2b whereas the percentagas quoted are based on the unrounded figures. Figures may not add to totals due to rounding.

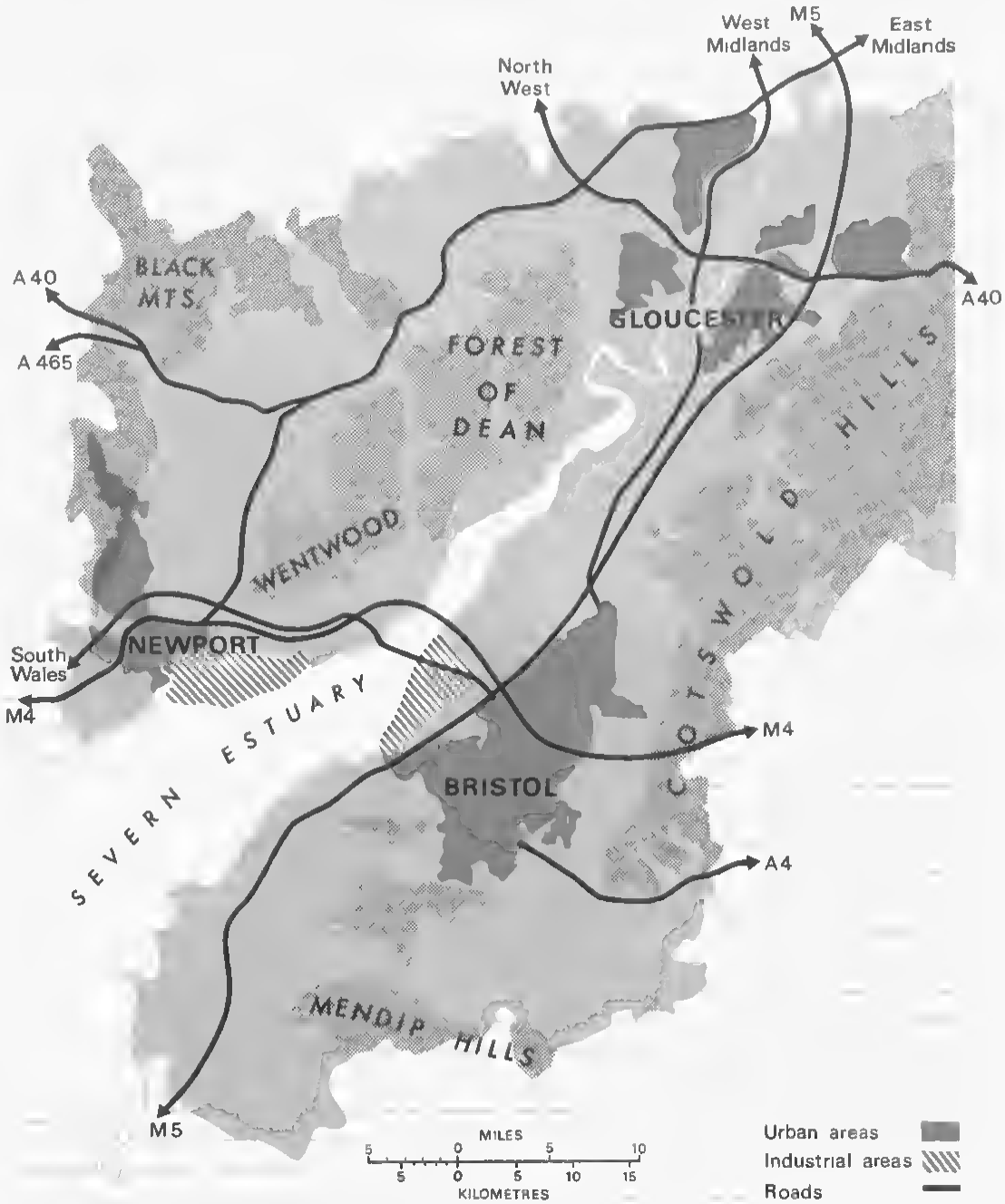


FIGURE 2 CONCENTRATED GROWTH: A POSSIBLE STRATEGY

With this development option a high proportion of the Aree's likely population growth over the rest of this century (estimated between 650,000–1,000,000) would be concentrated within the urban erees shown. Theee embrace existing large towns and associated major expension opportunities.

Such a strategy would create three 'urban sub–regions' based on Bristol, Gloucester and Newport. Elsewhere, growth would be on e smaller scale evoiding disturbance of attractive and historically interesting towns and villages end encroachment on wide areas of open countryside end important egriculturel areas.

The lines of a poseible atrategic road framework are indicated

Effects on neighbouring areas

2.32. If employment growth, whether in the 1970s or later, is held to present rates (which means for Bristol-Bath and North Gloucestershire almost entirely indigenous industrial growth) neither Wales nor other parts of the country should be seriously affected, assuming that national and regional economic behaviour does not vary markedly from present expectations. Migrants to East Severnside, if they follow past patterns (Figure 3 on page 67) will mainly come from the South East and the Midlands and not from Wales.

2.33. If it is decided to stimulate extra growth on Severnside in the 1980s then some call will have to be made on the national supply of mobile industry (paras. 9.2-9.4). The size of the total supply in the 1980s is not clear but it will still be limited as compared with the total possible demand (see, for example, the analysis of the needs of the South East in 'Strategic Plan for the South East').(3) If a major part of South Wales still needs a substantial inflow of industry at that time relaxation of idc control on East Severnside could have some adverse effect on that flow, though this should not be appreciable if financial inducements to industry continue to be offered in adjacent parts of Wales. Accelerated growth on Severnside might eventually have some consequential advantages for Wales and there might be similar 'spin off' for the rest of the South West region. Since migrants to East Severnside are likely to be largely from the Midlands and the South East it seems not unreasonable that some industry should come from the same areas, although this may mean that control over the location of industry in these regions will still need to be strict.

(3) HMSO 1970.

Summary of conclusions

2.34. Our main conclusions are:

i Severnside is an area whare we believe there will be continuing tendencies for growth sufficient to attract a net inward flow of about 7,000 people a year unless positive measures to restrict growth there, for which we can see no economic justification, ara taken;

ii This trend rate of growth with natural increase would laad to a total increase in population of about 450,000 by 1991 (compounding to 650,000 by 2001);

iii By auitable measures further growth could be stimulated in the East Severnside area, giving a maximum total increase in population for the whole araa of 600,000 by 1991 (compounding to about one million by 2001);

iv There will be planning problems in accommodating growth rates at these levels in the Area, but a number of good sites have been identified. The main practical options for the sub-areas are:

a *Bristol-Bath.* Total growth of between 200,000 and 300,000 by 1991 is possible, but it can only be accommodated if there is major development of the Frampton Cotterell site involving realignment of that section of Bristol's green belt and also problems of transportation and drainage. The alternative would be small and scattered development with much lower population levels for the sub-area and the need eventually for major overspill out of the area.

b *North Gloucestershire.* There is a wide choice of growth ratas for the 1980s and 1990s giving total growth of betwean 150,000 and 250,000 by 1991. Whatever the growth rates within this range, development, although closely associated with Gloucester, will evantually have to cross over to the west bank of the Severn. This should be accepted as a necessary part of planning for the sub-area from now on and a study of the various planning alternatives begun. A new town-type of organisation will probably be needed for development on the west bank. The Dymock site is another possibility but should be regarded as a longer-term reserve for the area.

c *Monmouthshire-Ross.* Substantial population growth in this area is inevitable and the most suitable sita is north of Newport. With new town-type treatmant for this site, we anticipate that growth in the sub-area would continue broadly at past trend rates, reaching 100,000 by 1991, and 150,000 by 2001. Since the latter figure is nearly the total physical capacity of this sub-area, accelerated growth is not desirable. A line for a second motorway in West Monmouthshira should be reserved as soon as possible. There are longer-term possibilities at Raglan and Caerwent.

v The end result of the strategies we recommend would be three well-defined sub-regions, each with its major centre of industrial growth and able to reap the benefits of large urban areas, but not so large as to run the dangers that could accompany excessive size;

vi This concentration of development around three major urban areas should be accompanied by green belts and other planning policies oriented towards the conservation of wide areas of attractive countryside and high grade agricultural land and of a number of important historic towns and villages;

vii Each sub-area would need to be planned as a whole, but planning of the whole Severnside Area by a single planning authority is not necessary;

viii Population growth on Severnside at any level between the limits suggested in ii and iii above will represent a significant contribution to dealing with the problem of locating the expected national increase in population;

ix The decision, which must be taken on national grounds, on whether growth on East Severnside should be stimulated in the 1980s will be needed by the mid-1970s. We believe, in view of the Area's economic potential and attractiveness that this possibility should be given very careful consideration.

Part 2 The Analysis

3 THE BASIC APPROACH

Introduction

3.1. The background to our task was the estimate in 1966 of a large increase in the national population by the end of the century and thus we have tended to think in terms of changes broadly up to that time. Many public investment items take a long time to plan and then last for a long time so that physical planning has to look a long way ahead. Sizeable population movements are also not likely to take place quickly. However, economic forecasting for as far ahead as the year 2000 is quite impossible and even the estimate of the natural growth in population for that time will be subject to substantial change if the birth rate continues to vary. If we assume plausible birth and death rates and the continuation of certain migration and employment trends we can estimate what the population and the employment in our Area would be in any future year no matter how far ahead. But we cannot say with confidence that these figures will in fact be achieved. In other words the figures are 'projections' of what *might* happen and not 'forecasts' of what *will* happen. Thus to some extent physical planning with its long time-scale is not easy to bring together with economic anelysis with its inability to look very far ahead.

3.2. We have attempted to resolve this difficulty by taking a number of dates in the future for verious aspects of our work:

1976—this is the furthest ahead for which we consider it is practicable to make even tentative economic forecasts.

1981—this is an important date because local authorities' present development plans tend to look about this far ahead and for the reasons given in Chapter 9 we believe that the relationship between the supply and demand of mobile industry will be easier after this date.

1991—this would in many ways be a sensible terminal date for planning purposes since the size of the adult population then is known with tolerable certainty and physical plans could reasonably be prepared now that far ahead. We have therefore made and assessed employment projections for the Area up to that date.

2001[4]—we have, in accord with our terms of reference, carried our projections forward to this year and where relevant give our final conclusions in terms of what might be done by that time. We do not suggest, however, that it would be sensible or practicable to formulate detailed plans to accommodate any particular population so far ahead.

3.3. We have found it useful to distinguish three components of the 'planning' process, as applied to our Study and to describe them by the following terms:

i Strategy—a set of preferred options covering the broad planning opportunities which exist for the long-term: a period for which it may be possible to discern the general scale and direction of growth but not to make detailed forecasts.

ii Plan—a set of proposals, derived from the preferred strategy, which is sufficiently precise for translation, as and when required, into development and capital investment programmes. The period covered would generally be the following 10 or at most the following 20 years, varying with the component items.

iii Programme—specific proposals for development and capital investment to be implemented over the relatively short-term, say 3-7 years, in connection with which it would be possible to make detailed economic forecasts.

(4) All these dates are Census years—hence 2001 and not 2000

The physical planning approach

Population growth[5]

3.4. Where possible we took the statutory development plans as a base. These cover various periods but we deduced (Chapter 5) that their policies and provisions implied that for the period 1966-1981 the population increase over the Study Area as a whole could be just over a quarter of a million. For initiating the physical planning work we decided to use as a guide a test figure of

(5) In the Study 'civilian population' rather than 'home population' figures have been used. Home population is all population actually in an area. Civilian population is the home population less H.M. forces and any foreign forces in that area. Armed forces in the Study Area amounted to 6,200 in 1966 of which 4,200 were in North Gloucestershire and 2,000 in Bristol-Bath.

growth of about 1 million up to the end of the century. This would not be inconsistent with past population trends in the Study Area which, if continued would give an increase of the order of 600,000–700,000. Moreover experience of New Towns and planned expansion schemes in other parts of the country suggest that such a scale of growth ought not to be out of reach so long as our feasibility study could show that sufficient physical planning opportunities and economic stimulus existed. At the same time, having regard to the main objectives of our Study, a growth of this order would be large enough to have a significant impact on the problem of national population distribution. With these considerations in mind, we decided that we would, in the main, investigate only areas which would be large enough to accommodate an urban population growth of the order of 50,000 persons or more. The only exception we made to this was on the fringes of the main existing towns where a number of separate sites could be related to the growth of a single existing urban area. This does not mean that we would rule out the development of other areas which may well, from time to time, have to be considered by the local planning authorities. But our role was to report on the physical planning opportunities for carrying out exceptionally large developments, not to undertake the comprehensive and detailed planning of the Study Area.

The nature of future urban areas

3.5. We had to make broad assumptions about forms of urban development in the future, at least in so far as these would affect the amount of land that might be taken and the general organisation of the Area's infrastructure. We did not concern ourselves with matters of detailed design.

3.6. The trend in housing demand is likely to be towards 'low-rise' developments with net residential densities not generally above 30 persons per acre; high densities are likely to be increasingly reserved for special locations and special demands. For land-uses other than housing there will no doubt be new demands and also higher standards, but we think that planning control and careful design can prevent a wasteful escalation in land requirements. At present the signs are that overall densities in the main urban areas of the country are moving towards 15 persons per acre—in areas where densities are higher than this, levels are generally falling while densities in areas that have only been loosely developed are tending to move upwards towards this level. In the Study we have carefully delineated the areas which we have selected as potentially suitable for expansion and we have excluded any significant areas which we think should not be taken into urban use. We have also separately identified areas specially suitable for capital intensive industries, some of which have very large land requirements. Accordingly, our selected urban areas should be able to accommodate population at overall densities of 15-18 persons per acre.

3.7. For the purpose of assessing the feasibility of developing selected areas we had to consider how urban systems were likely to develop over the next two or three decades. Recent studies suggest that factors such as the development of our educational arrangements and trends in retailing could strengthen and clarify the need for a cellular organisation pattern of settlement[6] which would tend to operate whether development were by way of dispersed free-standing units, clusters, or spatially continuous urban aggregations. This would tend to simplify the ordered and convenient growth of urban areas although there is unlikely to be a single ideal way in which to structure such growth. A grid pattern is often advocated as a physical framework which can provide the flexibility necessary to sustain continuing change and expansion on a large scale and deal with urban transport problems. We have, therefore, as one test of feasibility, checked to see that areas we would consider as possible candidates for development could, if the need arose, be fitted broadly into a hypothetical grid structure. This does not, of course, mean that we propose that any development should necessarily be carried out in grid form.

3.8. Finally, there is the important question of what other forms of new public transport investment are likely to be appropriate for the urban areas of the future. For smaller free-standing towns public transport is provided today largely for those who do not own a car. But for large towns public transport has also to be good enough to enable it to play a significant role in solving the problem of coping with the intensities of movement which big urban areas generate. The policies currently being developed in this direction are by way of controlled parking in congested areas coupled with the improvement of bus services including various means of providing priority or exclusive routes. Other possibilities, such as road pricing, may be in prospect but fundamentally they are variants of the same concept. None of them calls for a road network elaborate enough to provide for 'full motorisation', the cost of which could be unrealistically high or disastrous to urban environment and structure. All presuppose the use of some form of public service road vehicle. It is unlikely that rail or other forms of public transport requiring capital-intensive separate-tracked systems will prove acceptable or viable for intra-urban passenger travel except in the major conurbations. This would exclude their application on Severnside with the possible but not very likely exception of Bristol.

(6) The following is a highly stylised example:

Urban unit (population)	*Role in the urban hierarchy*
1. 2,500	An area which would be recognised by its inhabitants as their residential locality.
2. 5,000	Primary school catchment area.
3. 25,000 (i.e. 5 × 5,000)	Catchment area of a comprehensive school or of a shopping centre (with a supermarket, post office, bank and library); a small town if free-standing.
4. 50-150,000 (i.e. 2 to 6 × 25,000)	Catchment area of a 'district' centre; a large 'complete' town if free-standing.
5. 150,000+	A very large town or city with a major centre and several district centres.

Land requirements

3.9. Our assessment has thus not led us to postulate revolutionary changes in the physical nature of urban development for the period between now and the end of the century. With rising prosperity, urban areas will become more spacious and of better quality; some new activities will appear; there will be better planned provision for handling increased movements by roads; and major efforts will be made to improve the urban environment. In terms of land requirements all this, we believe, could favour the selection for building of gently undulating, well wooded, 'close' country within which future urban forms, with the assumed emphasis on low-rise housing, can be best assimilated and an attractive environment be most readily created. For manufacturing industry the trend may be towards lower employment densities with increasing use of single-storey buildings which offer flexibility for change in internal layout and plant and the demand for extensive flat sites, particularly ones suitable for major plants, is likely to increase. At the same time, as people become more sensitive to air pollution, noise and the nature of their environment, it will become accepted that big processing plants should where possible be set in open surroundings never closer, depending upon local topography and micro-climate, than two or three miles from residential areas. The service industries by their very nature are, however, for the most part generated by concentrations of population and it has seemed to us that the increasing proportion of all employment which is being provided in the services sector is a factor which will operate in favour of growth in and around the existing urban systems rather than in relatively isolated new locations.

3.10. Since major new urban developments will have to be especially attractive to people and industry, we have had regard, in considering where the necessary areas of land for possible development might be found, to such factors as environmental quality and scope for leisure activities, in addition to such essential elements as ease of communications and utility services. We have not taken the market price of land specifically into account in our selection process.

The economic approach

3.11. Although it is not possible to forecast the exact size of the population of Great Britain at the end of the century it seems probable that there will be a substantial increase over the 1968 population of the order of 11 million. Because of the high birth rates in the 1950s a large increase in the number of families in the 1970s and 1980s is inevitable. In addition, there is population which is at present unsatisfactorily housed and which is likely to be dispersed from urban areas of high density. Again it is not possible to be precise about the numbers involved but it could be a further 10 million. There will thus be very substantial deployment of resources on new urban development in the next 30 years both because of the increase in population and also because of the raising of living standards. It is reasonable, therefore, to examine alternative ways of accommodating this population, to look for advantages in one location against another and in one type of urban settlement as against another and to assess any benefits deriving from economies of scale.

3.12. From the economic point of view therefore one concern of our Study should be the comparative costs and benefits of development on Severnside as against other areas in Great Britain. Relevant information on other possible areas is not, however, yet available so it is not practicable to make comparisons of this kind. We therefore chose the concept of comparison with a theoretical 'minimum cost' site, by which we mean a notional area where each of the possible elements of cost is as low as anywhere else in Great Britain. As in our previous Study of Humberside[7], we have similarly not found it possible to quantify benefits explicitly, but wherever possible they have been considered, and many of our conclusions contain implicit recognition of the importance of these benefits.

3.13. The main economic elements of the Study can be summarised as:

i assessing the current economic strength of the Area and measuring its links with the surrounding areas and with the rest of the country;

ii formulating views on the prospects for the local economy over the next few years;

iii projecting population and employment in the longer term assuming present trends continue unaltered;

iv estimating some of the major differential costs in accommodating growth on Severnside.

3.14. The assessment of the Area's present economic strength is a matter of identifying the advantages and disadvantages of the Area for people to live in and for industry to operate efficiently. To help assess the latter we carried out an industrial survey which covered the majority of manufacturing establishments in the whole of our Economic Survey Area. The questions put in this survey asked manufacturers for their assessment of the advantages and disadvantages of operating on Severnside, and also for information on the supply of labour, its skills, and the net output per employee. The latter item we treated as an indicator of industrial efficiency. We considered it necessary also to examine the Area's economic links with surrounding areas, the performance of particular industries over the last decade and the supply and demand of labour.

3.15. We need to make a factual assessment of the Study Area's present economic strength to enable us to formulate views about the prospects for that economy. We did this in detail for the year 1976 by providing forecasts of employment by

(7) Humberside: A Feasibility Study. Central Unit for Environmental Planning. HMSO(1969).

industry and population for each of the three sub-areas (Chapter 8).

3.16. Chapter 9, which assesses the economic position on Severnside after 1976 is not intended to be anything more than a straightforward exercise using arithmeticel projections of employment and population, but allowing for major trends such as the growth in service employment. There is no certainty about the size of the future growth of population in Great Britain to the end of the century and certeinly the structure of tha national economy in the last 20 years of this century cannot be reliably forecast. The figures that are given for employment and population on Severnside in 1991 and 2001 are therefore primarily intended es pointers to what might happen if existing trends were to continue. We assessed these figures in the light of our knowledge of the Area's economy to satisfy ourselves that they seemed sensible and we considered whethar there were any particular trends in the Area which would make such projections impossible to attain. Then finally we considered what higher figures might be produced if the Area was chosen for mejor planned growth.

3.17. The subject of the fourth part of our economic approach has been touched on previously (pare. 3.12). The demand for much of the investment needed for major growth on Severnsida is certain to be required nationally in any case, wherever the major growth is loceted, so that it is importent to identify the balance of advantage between one Severnside location and another in terms of the differential cost involved. Our resources did not allow us to construct alternative detailed lend-use plans, even if our terms of reference hed required us to do so. We could not therefore calculate many of the differential costs which only detailed plans would identify, but we have considered those which were evidant at the broad level at which we were working.

Synthesis and interpretation

Rate of growth

3.18. One way in which our physical and economic work interacted was that while the physical assessment suggested the overall reasonable population limit for each sub-area, the economic analysis provided a basis for determining the likely rates of growth by which this capacity could be filled up. There is however no one optimum rate of growth in any given situation. In en area such as Severnside, which is growing already, further growth could always be slowed down, but at a price in terms of firms not being allowed to expand where they will and people who want to come to or stay in the area not being able to do so. On tha other hand accelerated growth could have its costs (as well as its benefits) in drawing in firms which might have been more efficient elsawhera in tha country and in encouraging additional population movement. In Chaptars 9 and 10 we have attempted to assess some of the factors influencing rates of growth on the various parts of Savernsida and some of tha costs which could arise from varying those rates.

Evaluation of alternatives

3.19. We interpreted our primary physical planning task as the identification of the Araa's capacity for change and the delineation of tha basic physical planning options on which any alternative strategias would have to be built. We felt that unless thesa were thoroughly investigated in the first instance it would be unwise to embark on potentially time-consuming and expensive datailed comparative evaluations. Secondly, it became apparent at an early staga that we were going to be able to demonstrate that thare would ba a range of options. It seemed to us that the selection of which of these were most likely to repay more detailed investigation could best be made in the wider forum which publication of our basic findings would make possible. Thirdly, while our physical plenning study was in progress it was agreed that land-use/transportation studies should be carried out by the locel highway and planning authorities for important parts of our Study Area in Monmouthshire and North Gloucestershire. These arrangements were made in liaison with the Ministry of Transport and the Roads Division of tha Welsh Office and ourselves so that these studies could provide ready-made machinery for evaluating the transportetion aspects of any of the development optlons which emerged from our Study. We recommend that a compatible land-use/transportetion study covering the Bristol area should be mounted.

3.20. Wa did not ourselves prepere a transportation model of the Area because we were unaware of any which we regarded as acceptabla for usa in evaluating alternative, broad, long-term stratagias over a wide and scattered araa lika Severnside. Experience with 'planning' models has been largely confined to transport and shopping and the techniques developed have baen designed to predict how these components of a detailed plan, as distinct from a broad strategy, might be axpected to function. We did feel, however, that there may be scope for exparimental work in tha development of relatively simple testing tachniquas dealing, for axample, with journey-to-work and durable goods shopping which are two important elements in urban locational and organisational policies. In this connexion we wera assisted by consultants, Nathaniel Lichfiald and Associates, who undertook an assessment of possible applications of a mathematical model dasigned to simulate flows of retail expenditure on durable goods in the Severnsida area. Their findings should be of interest, particularly to local planning authorities and others who may be concerned with elaborating and evaluating some of the davelopment options wa have identified.

3.21. Of the remaining chapters of this report, 4, 5 and 6 contain our account of the physical potential of the Area and the physical planning alternatives it offers; 7, 8 and 9 describe the present economy of the Area and its future prospects while 10 is about costs. The final synthesis of our work and our conclusions have already been set out in Chapter 2.

4 STRATEGIC PHYSICAL PLANNING POTENTIAL

Introduction

4.1. The purpose of this chapter is to assess Severnside's physical suitability as a location for major developments. In some cases, opportunities and limitations can be clearly identified: proximity to the estuary, for example, on the one hand, and on the other, areas of high land and of exceptional scenic beauty. At the same time there are a number of elements in the Area's infrastructure which could be modified if there were very large increases in population. There would need to be more roads, sewers, hospitals, etc, but these can always be provided, although we had to be sure that exceptional difficulties would not arise. The task in fact is to identify whether there are any exceptional features in the present situation which would make it more difficult, or more easy, to expand within the Area than in other parts of the country.

Urban and social infrastructure

The urban hierarchy

4.2. The geographical distribution of population living in built-up areas is shown in Map 2. These areas account, in total, for some 87 per cent of the total population in the Area, the rest live in villages, hamlets or isolated dwellings. With the possible exception of the Newport-Cwmbran-Pontypool area the settlement distribution inside the Area presents a fairly clear hierarchical pattern with distinct large towns within an otherwise open settlement network. Away from the main urban areas the pattern still reflects its basic agricultural origins, modified in the Forest of Dean and in the Norton Radstock area where there are scatters of small mining towns and villages. An analysis of this distribution, in terms of settlement size, is given in Table 4a. Although only some 13 per cent of the whole of the Study Area's total population

Table 4a

Study Area: population in built-up areas 1966

Settlement type	Number of settlements	Population	
		'000	%
(1)	(2)	(3)	(4)
All areas	—	**1,635·1**	**100**
City*	1	533·2	33
Towns	8	546·2	33
Population over 50,000†	4	406·3	25
Population 20-50,000‡	4	139·9	8
Other built-up areas	86	343·9	21
Population 5-15,000	28	235·8	14
Population 1-5,000	58	108·1	7
Outside built-up areas	—	211·8	13

* Bristol.

† Newport, Gloucester, Cheltenham, Bath.

‡ Weston-super-Mare, Cwmbran, Stroud, Pontypool.

(Note: In this Table a built-up area is taken to be a continuously developed area with a population of 1,000 or more and is not necessarily contained by administrative boundaries.)

Source: Office of Population Censuses and Surveys/Central Unit for Environmental Planning.

lives outside the built-up araas, the proportion risas to over 50 per cent over wide areas of tha Cotswolds, North Monmouthshire and the Ross area. The settlement patterns in the fringe areas show markedly different characteristics. The Wiltshira and Somerset fringe areas contain a numbar of small country towns, most of which have some manufacturing industry, but 33 per cent of the total population of 397,000 lives outside the built-up areas and the whole retains a strong rural character. In contrast the fringe areas in Monmouthshira and Glamorgan have a highly urbanisad population with only 28,000 (less than 3 per cent) of a total of 954,000 living outside built-up areas. Historically, too, the nature of this area's development has been very different from that of the rest of the Economic Survey Area. Most of Severnside has developed over a vary long period with tha pace of growth and urbanisation accelerating only in the 20th century, but the bulk of the devalopment in the Welsh fringe area was associated with the Industrial Revolution and the opening up of the coalfield and the originally sparse sattlemant pattern was completely transformed to produce a 'hidden conurbation' composed of ribbons of densa development in constrictad vallays. Much of this area was in decline between the wars, so that an unusually high proportion of its urban fabric is now ageing badly.

4.3. Within the Study Area itself an important factor is that threa-fifths of the population live in Bristol and in four othar large towns. Any plans for major expansion must take into account possible effects on the roles of thosa urban areas and on the ways they function, since their influance in such matters as shopping and travel-to-work spreads well beyond their own boundaries.

4.4. To consider their shopping role we had to look at patterns of retail spending over an area even wider than the Economic Survay Area, extending to the important centres of Swansaa, Swindon and Worcaster. Six centres of the Area are of particular importance—Bristol, Cheltenham, Gloucester, Bath, Newport and Weston-super-Mare, whila Cardiff, which is just beyond tha Study Area boundary, has important effacts within it. Our estimates of what, for our purposas, seem to be some significant elemants in these centras' patterns of retail trade are set out in Table 4b. These are derived from the last full Cansus of Distribution in 1961 supplemented by information from tha sample Census of Distribution of 1966. Tha available data deals only with whera the money is spent and the areas from which it is drawn can only be inferred, but analysis of the likely distribution of spending power based on average expenditure per head of the population shows that these seven urban areas must be drawing substantial trade from other areas. Our assessment suggests that in 1961 the net gain involved accounted for nearly a third of their total turnover.

4.5. The attraction power of thesa centres for 'convenienca' goods sales (i.e. food and other non-durables) seems to be broadly proportional to their population, with Cheltenham, Bath and Weston-supar-Mare deriving some additional sales from visitors. The more important differentials between centras arise, however, over salas of durabla, or 'comparison', goods (i.e. clothing, furniture, jewellery). In this field Cardiff's performance in 1961 was outstanding with an astimated net gain of £11·4 million worth of sales from outside its own immediata area. This was associated with its special relationship with the genarally poorly shopped valley towns and, parhaps, its position as a capital city. Tha county boroughs of Cheltenham, Gloucestar and Bath also attracted proportionataly high net gains from other areas but Bristol appeared to have no unusual drawing power in relation to its siza. This may have been because war-time bombing dispersed Bristol's trading and post-war re-building has left tha city with two separate main shopping centres as well as saveral important subsidiary cantras. The situation may have changad since 1961: the 1966 Census of Distribution recorded a 39% increase in durable goods sales at Bristol and this was before the opening of the Severn Bridga. However, the 1966 Census, which was sample based, provided littla

Table 4b

Main urban areas: estimated retail sales

Urban areas	Durable goods shops						Convenience goods shops		
	Sales 1961				Increase in total sales 1961-66		Sales 1961		
	Total	Attracted from other areas		Central area as % of total			Total	Attracted from other areas	
		Amount	% of total sales					Amount	% of total sales
	£m	£m			£m	%	£m	£m	
Main urban areas	**122·4**	—	—	—	**34·0**	**28**	**116·0**	—	—
Bristol CB	41·2	5·4	13	47*	16·0	39	48·9	12·0	25
Cardiff CB†	30·8	11·4	37	71	7·2	23	25·8	5·8	22
Cheltenham MB	11·3	5·4	48	81	2·7	24	8·7	2·9	33
Gloucester CB	10·5	4·8	46	87	2·4	23	7·6	2·0	26
Bath CB	11·1	4·5	41	79	2·2	20	9·6	3·1	32
Newport CB	12·4	4·2	34	79	2·1	17	12·2	3·8	31
Weston-super-Mare MB	5·1	1·5	30	85	1·4	28	5·2	1·7	33

* Includes the Broadmead and the Queen's Road-Park Street centres.

† Outside the Area, but with important effects within it.

Source: Censuses of Distribution 1961 and 1966.

or no data for individual centres and a hypothetical distribution of 1966 flows of retail expenditure on durable goods was mathematically derived by N. Lichfield & Associates (see para. 3.20). The results expressed in terms of estimated sales in the central areas of the main towns are set out in Table 4c. Such estimates do not have the same status as one obtained directly by survey but they do suggest that almost one-half of all durable goods expenditure in the wider shopping study area may have been concentrated in tha nine central areas listed in the Table.

4.6. The provision of the more specialised services normally associated with higher order urban centres follows the same general distribution as durable goods sales but is more highly concentrated in the larger urban areas. In this field we have taken as indicators the numbers employed at the time of the 1966 Census in the main commercial and business services (i.e. insurance, banking and finance, wholesale distribution, accountancy services, legal services, scientific and technical services, trade aseociations and business services) and, also, in entertainment. Because of the obvious importance of Cardiff in this context we have had to look beyond the Study Area and examine distributions over most of the wider Economic Survey Area (see Table 4d). Over this area as a whole nearly 70,000 are employed in these sectors of the service trades. The largest concentration, over 23,000, is in Bristol which, as a port, rail and road centre, is clearly particularly important as a wholesale distribution centre. Nearly 16,000 are employed in Cardiff, and a further 12,500 in the Study Area's four largest towns—Cheltenham, Gloucester, Newport and Bath. As might be expectad employment in entertainment is mainly concentrated in the two big cities—Cardiff and Bristol.

4.7. Employment and journeys-to-work in the Economic Survey Area are analysed in Tables 4e and 4f. Together with Map 3 they present a broad picture of the character of each of the main urban areas in terms of their importance as manufacturing and service centres or as dormitories and they illustrate the extent to which these areas generate journey-to-work movements.

4.8. Table 4e shows the distribution of employment over the greater part of the Economic Survey Area. Of the 1,152,500 jobs involved almost one-half are in Bristol and Cardiff and the four large towns of the Study Area. The indices given in columns 4-8 of that Table provide an indication of the role of each area. For example, Cardiff and Bath, each with 73 jobs in service industries for every 100 employed residents are clearly predominantly service centras. Bristol, Newport and

Table 4c

Main central areas: hypothetical durable goods sales 1966

Central areas*	Total £m	Attracted from outside the urban area	
		£m	% of total sales
Main Central Areas	**160.3**	—	—
Bristol†	29·7	17·9	60
Cardiff	29·6	20·8	70
Swansea	20·9	9·9	47
Worcester	20·9	16·7	80
Swindon	14·0	7·5	54
Newport	12·6	9·3	74
Gloucester	12·3	8·4	68
Bath	11·5	8·2	71
Cheltenham	8·8	7·0	79

* For definition of areas (within the Study Area only) see Annex 4A.
† Comprises Broadmead and the Queen's Road-Park Street centres.
Derived from flows of expenditure (at 1969 prices) simulated by a mathematical model.
Source: N. Lichfield and Associates.

Table 4d

Economic survey area (part): employment in commercial and business services and entertainment 1966

Area*	Population distribution	Commercial and business services and entertainment: Total		Insurance banking and finance		Wholesale distribution		Other business services		Entertainment	
		No.	%	No.	%	No.	%	No.	%	No.	%
Economic Survey Area (part)†	**100**	**69,480**	**100**	**23,730**	**100**	**22,190**	**100**	**18,650**	**100**	**4,910**	**100**
Main centres	28·3	39,060	56·2	12,260	51·7	13,490	60·8	10,250	55·0	3,060	62·3
Bristol	13·0	23,250	33·5	7,290	30·7	8,420	37·9	6,110	32·8	1,430	29·1
Cardiff	10·3	15,810	22·8	4,970	20·9	5,070	22·8	4,140	22·2	1,630	33·2
Other towns (in Study Area)	15·7	13,660	19·6	5,380	22·6	3,540	15·9	4,250	22·8	490	10·0
Cheltenham	3·1	3,530	5·1	1,910	8·0	450	2·0	1,040	5·8	130	2·6
Gloucester	3·8	3,440	5·0	1,090	4·6	1,330	6·0	980	5·3	40	0·8
Newport	4·2	3,020	4·3	930	3·9	950	4·3	1,040	5·6	100	2·0
Bath	2·9	2,470	3·6	970	4·1	560	2·5	800	4·3	140	2·9
Weston-super-Mare	1·7	1,200	1·7	480	2·0	250	1·1	390	2·1	80	1·6
Rest of Area	56·0	16,760	24·1	6,090	25·7	5,160	23·3	4,150	22·2	1,360	27·7

* For definition of areas see Annex 4A.
† The estimates cover the Economic Survey Area excluding Bridgwater MB and RD, Devizes MB and RD, Taunton MB and RD, Wellington UD and RD and Langport RD.
The estimates are sample-based and the smaller numbers are statistically unreliable; they have been retained for ease of presentation.
Source: 1966 Sample Census.

Table 4e

Economic survey area (part): employment distribution 1966

Area*	Jobs		Ratio of number of jobs to number of employed residents (employed residents within each area = 100)				
	'000	%	All sectors	Primary	Manufacturing	Construction	Services
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Economic Survey Area (part)†	**1,152·5**	**100**	**95**	**7**	**33**	**6**	**49**
Bristol	243·8	21	106	—	40	6	59
Cardiff	138·7	12	111	1	31	7	73
Newport	55·4	16	107	—	43	6	57
Gloucester	54·4		113	1	41	6	64
Cheltenham	38·5		98	—	22	5	68
Bath	37·7		103	1	22	7	73
Stroud Valley	21·1	6	100	1	56	5	38
Pontypool	16·3		98	8	46	8	37
Cwmbran	15·6		94	—	59	7	28
Weston-super-Mare	15·1		79	—	13	6	59
Rest of Study Area	212·6	18	80	12	26	5	37
Rest of Welsh fringe area	211·7	18	87	16	29	7	35
English fringe area (part)	91·8	8	95	9	36	6	44
Great Britain	—	—	100	5	35	8	52

* For definition of areas see Annex 4A.

† The estimates cover the Economic Survey Area excluding Bridgwater MB and RD, Devizes MB and RD, Taunton MB and RD, Wellington UD and RD and Langport RO.

The estimates are sample-based and the smaller numbers are statistically unreliable; they have been retained for ease of presentation.

Source: 1966 Sample Census.

Table 4f

Main urban areas: journey-to-work 1966

Urban area*	Employed residents ('000)	Ratio of number of home-workplace movements to number of employed residents (employed residents within each area = 100)				
		Total movements generated by urban area (Cols. 4 and 5)	Movements within urban area	Movements to and from other areas		
				Total (Cols. 6 and 7)	In	Out
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Bristol	230·7	118	88	30	18	12
Bath	36·8	123	80	43	23	20
Weston-super-Mare	19·0	111	68	43	11	32
Gloucester	48·1	128	84	44	28	16
Cheltenham	40·0	121	75	46	21	25
Stroud Valley	21·0	116	84	32	16	16
Cardiff	124·9	123	88	35	23	12
Newport	51·9	129	78	51	29	22
Cwmbran	18·6	136	58	78	36	42
Pontypool	16·7	140	58	82	40	42

* For definition of areas see Annex 4A.

Source: 1966 Sample Census

Gloucester are relatively more broadly based centres of employment. On the other hand, Cwmbran has only 94 jobs for every 100 employed residents with the opportunities mainly in manufacturing industry. Weston-super-Mare with 13 jobs in manufacturing industry and only 79 jobs in all sectors for every 100 employed residents is mainly a dormitory and a small service centre.

4.9. The main movement patterns are illustrated in Map 3. This is supplemented by Table 4f which shows for each urban area the number of intra-urban (column 4) and inter-urban (column 5) home-workplace movements generated per 100 employed residents. The most intensive and highly developed of the Study Area's home-workplace movement systems centres on Bristol. Substantial outward as well as inward movements take place in all directions, with Weston-super-Mare functioning as a long-distance commuter area. A much smaller system based on Bath is only tenuously linked with Bristol. In North Gloucestershire the main centre is Gloucester with linked sub-systems based on Cheltenham, and on the Stroud Valley towns. In Monmouthshire the pattern is rather more complex with Newport the main focus. Pontypool and Cwmbran are far from being self-contained, generating a relatively large number of movements between one another and Newport. Newport also draws on the Monmouthshire valleys from which, additionally, there is a strong movement across the River Usk to the Spencer Steelworks at Llanwern east of Newport. This Newport-based system also has links with the Cardiff area.

4.10. The pattern of population growth is closely related to these major journey-to-work systems. Since 1945 most of the Study Area's residential expansion has been in and around Bristol and the other large towns including, at Cwmbran, the building of a new town between the older towns of Newport and Pontypool (see Map 4). Within this pattern the three largest towns—Bristol, Newport and Gloucester—have already reached e stage of development where net migration iosses are occurring and most of the population growth associated with them is now taking place in the surrounding newiy developing areas.

4.11. A general inference which we would draw from the data on patterns of settlement, shopping, higher order service centres, employment, journey-to-work, and population growth is that a series of city region-type urban systems are emerging as significant elements in the urban organisation of the Study Area. These are at various stages of evolution but the Bristol erea, in particular, seems to us already to display on a smeller scale meny of the characteristics of the London metropolitan region. As fer es we can see there is little interlocking between eny of the three major systems, i.e. the one based on Bristol and Beth, the system evolving round Gloucester and Cheltenham in North Gloucestershire and the complex of Newport-Cwmbran-Pontypool (with Cardiff). The spread of these established systems is such that any large new developments would certainly interact with one or other of them, aithough to a decreasing extent the further away they are.

Education, health and welfare services

4.12. We are advised that in comparison with the rest of the country Severnside and its fringe areas are adequately sarved in the education field; there are Universities at Bristol, Bath and Cardiff. There are no grounds for anyone to fear that a move into the Area would jeopardise educational chances. This does not mean that the authorities there, as elsewhere, have no problems. In Gloucastershire for example, there has been a rapid increase in population in the areas immediately to the north and east of Bristol and a very substantial programme of school building has had to be undertaken. The same problem has been faced by Gloucester City, particularly in the areas recently taken over in the adjustment of boundaries. Again Bristol, and to a somewhat lesser extent Gloucaster City, have attracted a considereble number of Commonwealth immigrants for whom special educational arrangements have had to be made. The authorities in Wales have also faced increases in population in the urban areas due partly to natural growth but more to the shift of population away from the older industrial valleys. Secondary school re-organisation has been somewhat delayed, particularly in Monmouthshire, by difficulties in finding suitable sites for large new schools in the valleys. Similarly, as far as health and welfare services are concerned, the position on Severnside is unremarkable in comparison with the rest of the country.

4.13. However, since the aim in the planning of the country's education services, and of the health and welfare services, is to achieve a common satisfactory standard throughout the country, these facilitias adjust to population movements rather than exert a direct influence on regional planning. In consequence, the range and extent of the existing faciiities are of little use as a guide in determining the feasibiiity of an area to accommodate a large increase in population. We are assured, however, that they could be developed to meet the needs of an increase in population in the Aree at no greater cost than elsewhere in the country.

Housing

4.14. The only nationaily-based survey of the condition of the country's housing stock was carried out in 1964. The nature of the sample empioyed mekes it impossible to draw conclusions for an area such as Severnside and we have had to rely on the information ebout household facilities given in the 1966 Sample Census and on statistics of the numbers of dwellings declared to be statutoriiy unfit and of low rateable value. The relevant data is summarised in Table 4g. Statistical overiap and other disadvantages attach to these sources, but the evidence they efford does not suggest that there are any significant ebnormalities in the Area's housing situation. If anything the problem of the clearance of obsolescent dweilings, which would heve to be deait with simultaneously with building for any major expansion, would perhaps seem to be a slightly smaller one than that facing the country as a whole. As regards individual towns it is possible that the problem might turn out to be proportionateiy greater in Gloucester than in other places, but absolute numbers of dwellings involved would not appear to be unduly large and would, in fact, provide opportunities for some town restructuring which would be necessary with expansion. This last point was confirmed by our own examination of the town's fabric and structure which was carried out as part of an appraisal of all the main urban areas. These appraisals were not directed at housing as such but had as one aim the idantification of potentially redevelopable areas; the findings have influenced our selection of the locations whera large-scale extensions of towns appear faasible (Chapter 5).

4.15. To devise a long-term programme for the replacement of existing dwellings it would be necessary to carry out a proper survey of the condition of properties in sufficient detail for estimates to be made of their approximate remaining useful life, distinguishing between those dwellings which are, and those which are not, capable of improvement and modernisation. Such information could be rolled forward to produce estimates of the rates at which the Area'e stock could be expected to fall into obsolescence. To obtain a fuli picture of the 'indigenous' demand for new dwellings and improvements, excluding demands that would be created by planned immigration, it would be necessary to add in an astimate of any existing shortage together with estimates of the periodic additions to stock which would be needed for new household formation arising from natural changes in the Area's population. In the absence of adequate basic housing data we have not been able to carry through a comprehensiva exercise. We have, however, estimated that over the medium term 1966-81, this demand could be of the order of 150,000 dwellings. This level of demand is within the capacity of the

Table 4g

Study Area: housing stock 1966

Area*	Total dwellings ('000)	Dwellings built since 1951			Percentage of occupied dwellings			
		Total ('000)	Public sector ('000)	Private sector ('000)	Without indoor w.c.	Without fixed bath	Unfit	Less than £30 R.V.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Study Area	530·3	159·2	77·7	81·5	16	13	2·6	12
Bristol-Bath	288·4	81·0	36·0	45·0	14	12	2·2	6
Bristol	155·1	33·7	20·0	13·7	15	12	2·7	1
Bath	25·8	5·8	2·4	3·4	13	15	4·1	10
Rest of area	107·5	41·5	13·6	27·9	12	11	1·1	13
North Gloucestershire	149·1	45·4	17·8	27·5	18	14	2·3	21
Cheltenham	26·0	9·5	3·9	5·6	18	12	0·6	11
Gloucester	21·8	5·3	3·0	2·3	22	16	5·4	12
Rest of Gloucester-Cheltenham area	35·3	15·6	3·9	11·6	13	10	2·2	15
Cotswolds	19·3	3·9	1·9	2·0	16	14	1·6	26
Stroud Valleys	27·3	7·3	3·3	4·0	15	13	2·0	28
Forest of Dean	17·4	3·8	1·6	2·0	26	21	2·9	28
South Monmouth and Newport	76·7	29·1	21·8	7·6	21	16	4·1	13
Newport	36·7	11·8	7·6	4·0	21	17	2·1	1
Rest of area	40·0	17·5	14·0	3·6	21	16	6·1	23
North Monmouth and Ross Area	16·1	3·7	2·3	1·4	21	20	4·2	35
England and Wales	15,449	—	—	—	22	17	5·3	15

* For definition of areas see Annex 4A.

Source: Columns 2, 6 and 7 1966 Census, column 8 local authority returns, column 9 Inland Revenue, columns 3, 4 and 5 Ministry of Housing and Local Government and Welsh Office housing returns.

Study Area's building industry, as measured by recent performance.

4.16. More elaborata housing surveys and projections would not have been justified for the purposes of this feasibility study. But if a decision is taken to go ahead with a massive acceleration of development it would be advisable to put in hand a proper survey of housing conditions to assist the working out of a properly phased programme of housing investment and construction.

Places of architectural and historic interest

4.17. We have identified from the list of important towns prepared by the Council for British Archaeology and from the National Trust's atlas of places of beauty and interast some 125 hamlets, villages, towns and localities within towns which are recognised by these two sources as being part of the national heritage and which we think possess sufficient importance to be seriously taken into account in any plan prepared on a regional or sub-regional scale. These places range from individual stately homes to substantial urban areas. There is no national league table of areas of historical importance—the whole selection process is too subjective for that—but Severnside, like other areas of lowland Britain that have been well-sattled for many centuries and at the same time substantially escaped the ravages of the Industrial Revolution, must ba regarded as well-endowed in this field. Furthermore their value is enhanced by the great variety which flows from the Area's natural physical diversity.

4.18. It might, in consequence, ba argued that major urban expansions could be damaging. On this much depends on circumstances. With a medium-sized town where there is a major conservation interest, particularly in and around the historic centre, it may well be proper for regional policies to be aimed at relieving dastructive pressures. It is, for exampla, already accepted that Bath should be so protected and it ie, accordingly, contained within a closely defined statutory grean belt tha need for which we would not question. In axamining the possibilities for future developmente around Cheltanham, Chepatow, Monmouth and Roas-on-Wye we have taken similar considarations into account. On the other hand, a number of interesting areas are alraady embeddad in existing towns. Some, such as the Gaorgian aree of Clifton in the city of Bristol and the Cathedral Close in Gloucester, ara basically urban in charactar and conservation is a matter mainly of care. On the other hand, what were originally rural features have survived urbanisatlon less successfully, though country houses with their gardens and parklands have not infrequently been incorporated as town parks. While much more could be done to conserve the best of the rural buildings as urbanisation spreads, we admit that this is only second best; so in delineating the boundaries of areas which we think are worth considering for large-scale building, in saveral cases we have deliberataly excluded villages and country estates which could with advantage be conserved.

4.19. Altogether, we believa that the davelopment options we suggest in Chapter 5 demonstrate that there is sufficient elbow room in the Study Area for expansion to go hand in hand with conservation. On the positive side the wealth of interest which the Area offers undoubtedly helps to make it attractive to liva in.

Communications

General location

4.20. The main mass of the country's population is located in the big urban areas that stretch from London through the Midlands to the conurbations of Lancashire and tha West Riding. The Area is peripheral to this urbanised belt: close to the West Midlands and little more than 50 miles from the western edges of the London metropolitan area. Immediately to the west of the Area is industrial South Wales. Thus as far as the country's internal communications ara concerned tha Area is strategically well placed but outside the areas of potentially greatest congestion. Within such a broad concept the North Gloucestershire sub-area, at the head of the estuary and astride routes from London and the Midlands to South Wales and South Wast England, may be seen as occupying a peculiarly nodal position. So too does the area north of Bristol where the M4 and M5 motorways intersect.

Roads

4.21. By the mid-1970s the Study Area should have a complete framework of mejor inter-urban roads connecting to London, the Midlands and Cardiff. Its external links will be transformad with the completion of:

i the motorway M5 from Strensham to Avonmouth and on to Exeter;

ii the M4 from Maidanhead to Tormarton and from Newport to Cardiff;

iii the new and improved A40 and A449 links from the M50 to Newport.

4.22. Trend projections of future growth in traffic flows suggest that overload could eventually develop on two vital sections of the inter-urban network—the M4 from its junction with the M5 at Almondsbury to the west side of the estuary including the Severn Bridge and the M4 at Newport where it carries considerable local urban traffic. Both these sections are dual two-lane. However, overload is a relative term. For example, loads in excess of theoretical designed capacity can be met by some reduction in average speeds at certain times of the day and in such circumstances may be perfectly tolerable. Thus, quite apart from difficulties in forecasting future traffic levels it is not possible to pin-point the onset of disastrous congestion. All we can suggest is that at some time, possibly in the 1980s, there could be pressura to deal with these potential trouble spots. We think this will happen irrespective of whether development is specially promoted within the Study Area. We would also make the point that even though a second estuary crossing is a dramatic and expensiva item, we are not in a position to say that the problem points which we have identified are atypical of problems that will from time to time be arising in intar-urban networks elsewhere in the country. What we have had to satisfy ourselves, in the context of considering the feasibility of large expansions on Severnside, is that practicable solutions to these communications problems could be available if and when they are called for. In Map 21 we indicate some possible lines for any future extensions of the Area's inter-urban network.

4.23. As far as crossing the estuary is concerned existing geological data and other considarations suggest that it would ba reasonable to expect that a further crossing, either a bridge or tunnel, could suitably be providad in the vicinity of the English Stones. The possibility of crossing by means of a barrage, for which there could be a number of locations, is refarred to in para. 4.88. Wa have examined how a second crossing might fit in with existing and possible future road systems. One possibility would be to retain tha existing Severn Bridge primarily as a national and regional route with a new crossing linking more directly with the internal road systems of existing and possible new urban and industrial araas within the Area. Such a concept could be compatibla with a possible grid systam of primary routes which we suggest may ba one way of facilitating furthar major growth north-east of Bristol (Chapter 5 and Map 16) and also with any possible major industrial development on the Caldicot Level. We cannot place a figure on the cost of building a second crossing but it would certainly be higher than that of the present bridge which utilised the easiest crossing site. Because of this thare could ba advantages in trying to avoid the early locating of any new traffic generators in places where thay would lead to heavy local incraased use of the present bridge and henca to an aarliar investment in providing an expensive new crossing. Also, the siting of new developments within the general area of possible new crossing points could, unless carefully plannad, complicate the eventual provision of a further crossing. Since we have identified several proposals and opportunities for development within 3-5 miles of the existing and possible future crossing points, the effect these developments could have on traffic across the estuary will be an important factor in assessing their merits. There is a strong case for keeping developments which have no precise locational ties out of this crossing zone altogether.

4.24. In addition to materially improving Bristol's position on the main east-wast route between London and South Wales, completion of the M4 will provide a fast route, via Newbury and then via the A34, to Southampton and the developing areas of South Hampshire. The existing direct route via Bath and the A36 has not a high capacity and as far as its sections that are within the Study Area are concerned there would be topographical and amenity problems in providing a high standard road. The inter-urban road plan as set out in the White Paper *Roads for the Future*[8] did, however, indicate an intention to investigate the need, and the possibilities, for a new road linking the M4 near Mangotsfield with the A36 near Warminster.

4.25. Growth of traffic on the Severn Bridge could be influenced by development of what was formerly the main road to South Wales—the A40. Part of this route figures in the network set out in the White Paper. We have examined how such a road could be integrated into an expansion of the Gloucester-Cheltenham area. Map 18 indicates how this might be done. It involves amenity problems

(8) Cmnd. 4369.

near Cheltenham and complications with the existing A40/A417 route which has evolved on a somewhat ad hoc basis in the vicinity of Gloucester. If our suggestions for urban growth in thie area seem acceptable we would recommend eerly study of this length of the A40 route.

4.26. The White Paper envisaged the improvement of the existing A40 road west of the River Severn to its junction with the M50 route at Ross. In the context of our suggestions in Chapter 5 for major development west of the river we think consideration should be given to a re-routing through the Leadon valley on or near the line of the present road B4215. Our identification of possible sites for development has allowed for this possibility. In the same context we think that the A49 route to Merseyside, which was included in the White Paper as a strategic route, could similarly be modified so that its southern section followed the general line of the B4215. This route could bypass Hereford.

4.27. The A49 route bypasses the West Midlands and its development would to some extent reduce pressure on the M5; so will the proposal to provide a new motorway link from Strensham junction to the East Midlands. In our selection of possible areas for development we have, nevertheless, allowed for a duplication of the M5 (or the A38) as far south as Bristol should this ever be needed, as it might be if there is major growth in the West Midlands in the direction of Severnside as well as in East Severnside.

4.28. Should these possibilities which we have identified for developing the inter-urban network serving North Gloucestershire ever be implemented this sub-area's elready good communications would become outstanding and the present virtually undeveloped areas west of tha River Severn would enjoy locational advantages equelly as good as those of the already urbanised east bank.

4.29. As regerds Monmouthshire, and South Wales generally, eccessibility to the national network has been revolutionised by the construction of the Severn Bridge and completion of the M4 to Newport. The M4 ie being extended westwards to Cardiff but the existing stretch through Newport, where the existence of no less than five junctions gives it a local distributor role, could become a serious bottleneck. Completion of the new link from Newport to the M50 will aggravate this problem. The implications of this for South Wales could be considerable and we have felt obliged to satisfy ourselves that a practicable route exists for duplicating the M4 from our possible second estuary crossing point westwards at least as fer as Cardiff. We have identified two possibilities—one to the north and one to the south of Newport. In comparison with the nature of possible new routes we have investigated in other parts of the Study Area these are physically difficult. But they appear to be the only reasonably practicable ones and it hes seemed to us that it would, in any circumstances, be prudent to keep them open. These routes are discussed further in Chapter 5 and are shown on Map 20.

4.30. The improvements already carried out and in hand on the West Midlands-South Wales route via the M50, A40 and the existing and proposed A449 routes raise the question of the development potential of extensive areas eround Raglen that are topographically *prima facie* suitable for large-scale building (see Chapter 5). Our impression is that e major development here might lead to difficulties with the Area's inter-urban network. Firstly, we have found only one reasonably practicable route ecross the Wentwood Hills from the Raglan area to the estuary—and this is a difficult one. Secondly, although there will be a reserve capacity on the new and improved M50/A40 route, we see no obvious way of ever eugmenting this in the foreseeable future over the stretch north-east of Raglan.

4.31. In sum, apart from these difficulties in connexion with eny new development at Raglan, possibilities exist for considerably augmenting, if necessary, the Study Area's main inter-urban network. We have not attempted a deteiled traffic evaluation; the next stage would be for these possibilities to be considered in the light of the results of the tests of the proposed national strategic road network outlined in *Roads for the Future*.

Railways

4.32. Over the pest 15 years or so the Study Area's rail services have been substantially rationalised; but the network (see Map 5) is still an extensive one. Apart from branch lines used exclusively for freight, the network is double track with four tracks on the section between Cardiff end Severn Tunnel Junction end Filton end Bristol Temple Meads. All services are diesel operated.

4.33. British Railways' modernisation plans include the provision of new track end automatic signalling. Priority is being given to:

i the Bristol-Newport line linking the two sides of the Severn estuary;
ii the Cerdiff-London and Bristol-London lines;
iii the Swansea-Cardiff-Newport-Gloucester and the Exeter-Taunton-Bristol-Gloucester routes to Birmingham;
iv the Worcester-Oxford-Reading-London line.

British Railways are concentrating on the development of inter-city services end trains at hourly intervels are now running on the South Weles-Bristol, Cardiff-London and Bristol-London routes. Journey times have been progressively reduced. The fastest trains now bring Newport and Bristol within 30 minutes of ona another, and within 43 minutes of Gloucester and between 103 and 110 of London end Birmingham. The local services operated on these main rail routes, e.g. stopping services between Bristol and Newport, Bristol and Taunton, end between Newport and Gloucester ara unremunerative and are being maintained by Government grants which are subject to review from time to time.

4.34. The secondary rail routes comprise the Newport - Hereford - Shrewsbury line (the 'border route') to North Wales and the North West, the cross-country Bristol-Westbury routes to the South Coast via Yeovil end Selisbury, the Cheltenham-Gloucester-Swindon line to London, and the branch line from Bristol to Severn Beach. Plens include conversion of some sectors of these lines to single track working. The inter-city services between South Wales/Bristol and the North West are being concentrated on the route via Gloucester and Birmingham, leaving the 'border route' to connectional and local services which are unremunerative and grant-aided. Services on the cross-country routes from Bristol to the South

Coast and the Bristol-Severn Beach service are similarly unremunerative.

4.35. The comparatively few remaining branch lines that are used exclusively for freight serve either docks, e.g. the branch lines to Sharpness and from North Bristol to Avonmouth, or special local needs, e.g. the branch to Portishead serving the power station there. The bulk of the rail-borne freight is carried on routes used for passenger traffic. British Railways' policy over the past few years has been to concentrate general freight and coal traffic on a restricted number of railheads each serving a large catchment area and involving wide use of road transport for collection and delivery. The growing national system of freightliner services for containerised traffic, with terminals at some twenty of the big industrial centres and ports, does not yet include services operating directly to and from places within the Area. There is, however, a freightliner terminal nearby at Cardiff, opened in 1967, from which there are services to and from London, the east coast ports, Manchester, Liverpool and Sheffield. The intention is that additional freightliner terminals and services will be provided as and when justified by further growth of containerised traffic, which at present accounts for only a small proportion of all freight handled.

4.36. While railways are suitable for long-distance trunk movements between main centres of population and industry, it is recognised that roads will continue generally to have the major role in the movement of both passengers and freight. The part which the railways might play in any major expansions on Severnside will depend upon future policy for the railways generally and upon developments such as the projected gas-turbine driven 'advanced passenger train' capable of speeds of up to 150 mph. What can be said now is that the Area possesses a good railway network which could be expanded to cope with any additional long-distance passenger and freight traffic likely to be generated by future large-scale growth in the areas identified in Chapter 5, all of which are within more or less easy reach of existing railheads. Less clear is the role the railways might play in meeting future local travel needs, particularly of commuting workers, arising out of major growth. As already indicated present suburban services in the Area are maintained by Government grant and have an uncertain future. The extent to which commuter services might be desirable should be examined more closely along with the testing of the road traffic aspects of growth (para. 3.19).

Airports

4.37. The Area is served by two airports which merit classification as 'regional' airports: Rhoose, 10 miles south-west of Cardiff, and Lulsgate, 8 miles south-west of Bristol. Both are run by local authorities. Each handles approaching 200,000 passengers a year on shorter holiday flights and on some domestic and European services; Lulsgate also deals with over 4,000 tons of freight a year. Staverton airfield, between Gloucester and Cheltenham and run jointly by the two local authorities, handles some charter flights and private and commercial flying. For international services the Study Area relies mainly on Heathrow. British Rail run special connexions to airport buses at Reading station and journeys from Newport and Bristol can compare not unfavourably in terms of time with those to Heathrow from some suburban centres in London.

4.38. The longer of the two runways at Rhoose has recently been extended to 7,000 feet. Current limitations on major extensions are the nearness of Rhoose village and the existence of St Athan RAF station 4 miles to the west. Although access is at present only by local minor roads this airport is well located to serve most of South Wales but is not particularly convenient for east Monmouthshire. Lulsgate is approached by the existing A38 road from Bristol but no other access routes are planned. The three runways are on a ridge which would make unrestricted lengthening very expensive: the longest runway has been extended to 6,000 feet and a further 3,000 feet eastwards might be obtainable if the A38 were lowered or diverted. Its hilltop siting does produce visibility problems at times, though on these occasions the low-level sites at Rhoose and Staverton are usually clear. Staverton has three runways but its approach path is over Cheltenham and although excellently placed in the surface communication networks, noise nuisance would rule out any regular use by large jet aircraft. This site has a great potential in an expanded North Gloucestershire as an industrial and distribution estate complete with airstrip for business flying. It might also have a future should vertical or short take-off and landing planes be further developed.

4.39. Air traffic is increasing at both Rhoose and Lulsgate and in their present roles these seem to be serving their local catchment areas tolerably well. Neither, however, is ideally placed for the main development possibilities we identify in Chapter 5. To what extent is this a disadvantage? As far as internal air services are concerned it appears that these cannot normally compete with rail or road in terms of overall journey time and frequency for distances much under 200 miles. One of the Area's advantages is, in fact, that it is readily accessible by rail and motorway to the country's main centres of population and air travel would not seem to come into its own except for journeys to and from, say, Scotland and the North of England. Accessibility to scheduled European and inter-continental services would, however, clearly be an asset and this raises the question of the possibilities for developing an international airport which could serve the Area.

4.40. Present concepts for such major airports involve the provision of four 19,000 feet runways, a total airport area of about 23 square miles and a capacity for some 144 aircraft movements an hour which could produce noise hazards over an area stretching some 26 miles long by about 4 miles across. The only location for such a project within our Study Area would be on reclaimed land within the Severn estuary where the approach and take-off flight paths can be largely over water. One proposal, an outline of which has been worked up by W S Atkins and Partners, consulting engineers, is to reclaim the Welsh Grounds for this purpose[9] (see Map 12). An international airport would bring substantial employment with it, calling for appropriate urban development. However, this cannot be decided

(9) Severn Barrage W S Atkins and Partners.

on the relatively narrow issue of the needs of a Severnside expansion and the wider studies which would be involved certainly cannot be mounted until the present major controversy over the siting of London's third airport has been settled. Any such project would be one for the 1980s and, in any case, Severnside as a location would be in competition with several other parts of Great Britain. We have not, therefore, made positive provision for this airport or for its associated urban development in the Study, although nothing we propose would rule it out as a longer-term development.

Natural resources

Agriculture

4.41. Topographically (see Map 6) the Area contains mountain districts with semi-natural vegetation, such as the Black Mountains, and areas like the Somerset Levels which are below high tide level and are mainly grassland. Between is a range of upland and lowland farming areas. Climatically, most of the area is similar to the rest of lowland Britain but its topography produces significant variations. In particular rainfall is heavy, with over 50 inches a year, on the high areas to the west—the Welsh Valleys and the Mendips. Within the Study Area, the crests of the Cotswold Hills and most of Monmouthshire and the high areas of the Forest of Dean get over 35 inches. The English lowland areas tend to be drier with the easterly area around Gloucester and Cheltenham having about 27 inches; the sheltered Parrett basin also has a low rainfall. The Area's westerly location, with the estuary helping maritime influences to penetrate inland, produces an equable climate with few extremes of temperature. Geology is varied with a succession of limestones, sandstones, shales and clays overlain in parts by local and, in the northern areas, glacial dritt deposits. The pattern of soil series is, accordingly, intricate and we have had to adopt some degree of generalisation. The effects of topography, climate and geology are all reflected in the grading of agricultural land which is summarised in Map 7.

4.42. The only extensive areas of grade 1 end 2 agricultural land are near Ross and in central and southern Monmouthshire and in north-west Gloucestershire—with smaller areas widely distributed in parts of north Somerset and in the Gloucester area. Land of this quality constitutes only about a fifth of the land in England and Wales. Although the value of agricultural output per acre is low in comparison with the returns associated with urban uses the total output is significant from extensive areas of easily farmed land that are free from urban trespass. We would, therefore, regard the existence of large continuous areas of high class farming as a restraint on urban development. For the most part, however, the areas which we identify in Chapter 5 as most suitable for building do not involve the grade 1 and 2 areas. Major conflict arises only with possibilities, which in any case we are suggesting could best be treated as long-term, in the upper Leadon valley and around Raglan and Llanarth (see paras. 5.43-5.46, 5.69, 5.71-5.73). A possibly more immediate, but smaller-scale problem, could arise should development between Cardiff and Newport extend into the horticultural areas of the Rhymney Valley (paras. 5.57 and 5.58).

4.43. Elsewhere the best physical planning possibilities mainly involve grade 3 land which constitutes the bulk of the land in the Study Area. Some of this land can produce high yields of one or two of the more important national crops, but we have no reason to think that the loss of agricultural output which would result from developing this type of land on Severnside would be significantly different from what would occur with typical alternative locations elsewhere in lowland Britain.

Geology and minerals

4.44. The Area's geology is illustrated in Map 8. While it has been a major factor in the evolution of the Area's topographic and scenic character and itself produces features of special scientific interest which need to be safeguarded, the main points of significance for the present Study are:

i site conditions, i.e. stability for foundations, ease of excavation, underground services and earth moving;

ii location of commercially valuable minerals which, on the one hand, will influence the selection and programming of areas for building and, on the other, will provide raw materials for building or for manufacturing industry.

4.45. Disturbed strata occurring along the length of the Cotswold scarp, particularly around Bath and Stroud and the outlying Dundry Hill south of Bristol, lead to instability which would inhibit large-scale building, while landslip hazards exist on the flanks of the mining valleys west and north of Pontypool and in the valleys in the Black Mountains. Topographical and scenic considerations would, in any case, rule out development in most of these areas.

4.46. Some locations which would be too high for urban development are affected by solution-enlarged cavities produced by circulating groundwater which can cause subsidence or slipping in limestone areas. But, importantly, it also occurs in the Caerwent area where we would consider expansion possible in some circumstances. It would not entirely rule out the area for development, but there would have to be detailed surveys of the whole of the Carboniferous Limestone tract before plans were finalised.

4.47. Unstable conditions are also liable to be encountered on the extensive areas of alluvium which border the estuary. The precise nature of these deposits has not been clearly established though it is known that there are thick layers of peat in the Somerset areas. The areas north of Avonmouth and at Caldicot and Wentlooge in Monmouthshire are composed of

clays, muds and thin seams of peat and generally hava a low bearing capacity. Extensive piling is necessary especially along the sides of any buried channels, and fill may be required to improve both surface stability and drainage. On the whole, tharefore, these areas are only suitable for industries whose paramount requirements are for a particular location with very large areas of flat land and whose investment in plant and buildings ara high enough to absorb expensive site development works. For this, and for environmental reasons, wa would not normally regard any of these low-lying areas as suitable for housing.

4.48. In addition to load-bearing problems, cement is attacked by the ground water in the Lias Clays end Keuper Marl, which are prasent in some of the areas wa identify as suitable for building. It would, therefore, probably be advisable to use sulphate-rasistant cament for below-surfaca work in these areas.

4.49. Altogether, therafore, apart from tha spacial circumstances of the estuarine sites, we would not expect any really unusual foundation conditions in any of the areas we regard as suitable for devalopment.

4.50. We hava considered the geological constraints on an additional estuary crossing. Our assessment of development possibilities suggasted a crossing below the existing Severn Bridge somewhere near the English Stones. The geological evidence reveals no graat structural disturbance along the section of the railway tunnel that was built in the 1880s and it is likely that the conditions encountered extend over the whole of a potential crossing zone. A site slightly to the north of the present tunnel would provide solid rock for tunnelling not far below the channel floor. With a bridge, the English Stones and Gruggy could take load-bearing pillars, though the anchorages for a suspension-type structure might have to be vary deep on the Gloucestershira side where estuarine daposits are extensive. We have, however, assumed for the purposes of the Study that it would be practicable to construct a road tunnel or a bridge near this point.

4.51. As regards minerals, the Study Area has workings for limestona, sand and gravel, coal, celestite (or celestine), fuller's earth, clay, sandstone, and iron oxides. The locations of the main ones are shown in Map 8.

4.52. Carboniferous Limestone provides the principal source of aggregate: about 6 million tons a year are produced in the main quarrying areas of South Gloucestershire, Somarset, the Forest of Dean and Monmouthshire and a further 3 million tons in the neighbouring East Mendips area. In addition, sandstone of Carboniferous age is quarried near Cromhall and forms a good quality, skid-resistant road-surfacing material. Both the limestone and the sandstone quarries are of national significance with market areas extending into South East England. For this reason we have taken into account the extent of these valuable deposits in selecting our potential building areas, particularly in South Gloucestershire and near Caerwent. Large-scale developments, for example, by way of a north-easterly expansion of Bristol are possible without seriously interfering with the major quarrying areas.

4.53. Total production of sand and gravel in the Study Area amounts to only about 3 million tons a yaar and half this comes from the Upper Themes araa which sends much of its output eastwards. None is produced in the Monmouthshire araa. Nearly a third of tha total, mainly sand, is dredged from the estuary and landed at Bristol and Newport, butextraction is ovartaking replenishment and the replecement material is becoming finer in grade. Much of tha gravel produced in Severnside is from relatively soft Jurassic limestona and would not be suitable whera a high crushing strength is required. However, this does not present any special problems in view of the availability of crushed Carboniferous Limestone aggregates which could be produced in adequate quantities to meet any expansion of road making and building construction. Thera are amenity objections to unrestrictad working of tha limestone in soma areas aspecially in tha Mendips and the Forest of Dean, but locally producad supplias could ba supplemented if necassary by sea-borne crushed rock from coastal quarries in North Wales and the West Country, for instance.

4.54. No cement is produced within the Area but thare are seven works within 25 miles of its boundaries In South Wales and at Westbury, Oxford, Harbury, Southam and Rugby. Local brick production is on a small scala with a minor concentration of works around Bristol. For bulk supplies of bricks the Area relies mainly on large producers in South Wales and other parts of the country, although clay and shale, which may be commercially suitable for brick making, are common anough in Severnside.

4.55. The main mineral deposits, other than those yielding raw materials for the construction industries, are the Coal Measures. In Monmouthshire parts of the East Crop of the South Wales coalfield extend into the Area west of Pontypool and south-west of Abergavenny. The Bristol-Somerset field falls into three main parts—tha Coalpit Heath section north of Bristol, the Pensford section and the Radstock section which is on the edge of the Study Area. There are also small detached coal basins near Avonmouth, Nailsea and Clapton. The Forest of Dean coalfield is entirely exposed at the surface.

4.56. In the Monmouthshire area workings are now concentrated in a single group of collieries. Mining has been below steep slopas and high land and any subsidence would not affect areas which we might consider for possible future large-scale development. In the Forest of Dean mining is now carried out by a few private operators. Here again the areas involved are not those where we think there are any possibilities for major urban development.

4.57. The run-down of mining in the Bristol-Somerset field has been very rapid and workings are now confined to one pit. Risk of subsidence in areas which we heve considered for development is limited to past workings in the Coalpit Heath basin and the Kingswood coalfield, many of which were carried out ovar a 100 years ago and are often unrecorded. So far none of this hae inhibited building. It is normal practice in these areas to saek advice from the National Coal Board or the Mineral Valuer and to carry out exploratory surveys if necessary. Map 8 indicates those areas where these precautions are necessary.

4.58. The Area contains the only worked deposits of celestite in this country. This little known

mineral is a crystalline form of strontium sulphate and is used mainly to provide red colourations in pyrotechnics. The main deposit occurs in a narrow belt running north from Yate; output accounts for two-thirds of the world's supply. Map 8 shows the extent of possible workable deposits over areas north of Bristol that we would regard as well located for future building.

4.59. Extraction has not hitherto precluded subsequent building developments. The mineral occurs at shallow depth as bands and nodules and the excavated material from which it has been separated can be used immediately as back-fill. So far this process has caused little disturbance but excavations are going down to 30 feet and examples have already occurred at Yate town centre where buildings have had to be on raft foundations. This might be avoided if the back-fill in the deeper excavations were replaced in shallow layers, with each one being consolidated by levelling machinery. A 30 feet depth would involve the handling of about 50,000 tons of back-fill per acre to obtain, typically, some 500-1,000 tons of celestite.

4.60. The mineral itself has been fetching £13-£17 a ton since early 1969, which represents an increase of £5-£6 a ton on the prices which had been operative over many years previously. Over half is exported to the USA where the demand has been mainly linked to military requirements, but other uses are becoming more important, e.g. in colour television and conversion to strontium ferrite for small magnets. The strontium salts for these have a much higher value than the unprocessed celestite. We have not been able to assess the long-term effect of such possibilities on demand but there is evidence of quickening interest in this mineral. Total output has fluctuated, but has tended to be around 10,000 tons a year, which means that workings can affect, say 10-20 acres a year. The extent of workable deposits is speculative; so far trenching down to about 15 feet is the only reliable method of prospecting. There could be over 1,000 acres of workable deposits in the area between Yate and Cromhall Common; theoretically, there could also be important deposits elsewhere in the vicinity including the Latteridge area.

4.61. A major issue could present itself if these possible reserves are proven commercially and if current ideas for important new uses fructify, since these deposits are the highest quality source of strontium known anywhere in the world. They are located within what we would regard as the strategically natural areas for any major expansion of Bristol where (Chapter 5) we suggest it might be possible to accommodate nearly 350,000 additional population in a major area for development. On present evidence we doubt whether the possible existence of celestite deposits should rule out large-scale urban development altogether. The extent of the areas involved affords a choice of areas for building and for mineral working as well as opportunities for phasing extraction and development. One possibility would be to locate major open spaces on areas that might eventually have to be excavated and subsequently reinstated. But we would recommend that any decision in favour of major growth should await the outcome of the mineral survey being carried out by the Institute of Geological Sciences with the co-operation of the industry, and an up to date assessment made of the potential value of celestite.

4.62. The only other minerals worked within the Area are fuller's earth, which is mined south of Bath at South Stoke, and iron oxides which are excavated at Winford in the Mendips and processed in the Winford Red paint and pigment works. Haematite iron ore has in the past been worked extensively in the Forest of Dean.

The countryside

4.63. Under this general heading we attempt to assess the interaction that occurs between an urban area and its surrounding natural environment. On the one hand urbanisation can modify and, in many cases, destroy natural vegetation and wildlife; but so indeed can commercial agriculture and forestry. Physical development can extend into and intrude upon areas of attractive countryside, or, even where this does not actually happen, an increase of traffic and movement of people can destroy the natural peace and quiet. But on the other hand the presence of fine landscapes, countryside and areas of water is an asset to an urban community and we could not take the view that urban growth should be relegated to dull, or even derelict, parts of the country. In the particular context of this Study we would, in fact, make the point that expansion is most likely to be successful, other things being equal, in pleasant areas where people will want to come and live. These are intangible aspects and we cannot pretend that we have been able to present them in other than mainly subjective ways. Map 9 is, however, a straightforward presentation of the basic elements in the situation: it records the geographical incidence of the Area's main topographical features, the areas considered to be of special landscape value, sites and areas of special nature-conservation importance, the main forestry areas and, also, areas of grade 1 and grade 2 agricultural land where commercial agriculture is bound to be the prime factor in countryside management.

4.64. As far as the conservation of nature is concerned we have had the benefit of an outline appraisal of the Study Area carried out by the Nature Conservancy. There are some 80 sites already formally scheduled as of special scientific interest as well as sites of local interest controlled by County Naturalists' Trusts. Some of these, such as the Wildfowl Trust's land at Slimbridge, the sandstone crags of the Honddu Valley and areas of Cotswold beechwoods cover very large areas extending over a thousand or more acres. In total, however, these selected areas account for only a small part of the whole Study Area and a wider reconnaissance survey was made of the general distribution of natural and semi-natural vegetation types from which the Nature Conservancy have been able to derive a broad division of the Area into areas of high, intermediate and low nature conservation interest (see Map 10). Their recommendations are that major development would be least damaging to wildlife if it could be located north-west of Gloucester, north of Bristol and near Newport. They would also be averse to the adoption of linear and dispersed urban forms which would spread urban influence over wide areas of country.

4.65. The Nature Conservancy also gave some consideration to the extremely difficult question

of what overall level of urbanisation the Area might reasonably absorb without creating a disastrous impact on the countryside. In addition to the direct effects of the actual spread of development, expansion brings with it:

i the need for constructional materials, power, and water supplies;
ii interference with established drainage patterns;
iii air and water pollution;
iv recreational activities.

Most of these are harmful to wildlife, although mineral workings, for example, can produce new habitats.

4.66. Recreational activities are perhaps the most complex to assess. Much of the Area is in any case of more than local significance: it is within a day's trip of the Midlends and also has to cater for holidays and for holiday makers passing through it on the way to the South West and Wales. Local population increase is not, therefore, the only factor. Also a good deal can be done by management to arrange zones for different intensities of use and by restricting usage over certain periods. Country Parks can do much to take the load from vulnerable conservation areas. The Nature Conservancy's impression, based necessarily on e mainly theoretical approach to the degree of compatability between wildlife and urban land uses, was that a population increased to a total of about 6 million would produce an area completely dominated by urban development with wildlife virtually squeezed out; on the other hand they believe that e doubling of the present population to say 3 or 4 million would bring a decrease of wildlife, but not a disastrous one.

4.67. As regards landscape the Aree contains part of the Brecon Beacons National Perk: the Malverns and the Cotswolds are approved by the Countryside Commission es Areas of Outstanding Naturel Beauty end the Wye Valley end the Mendips are well edvanced towards approvel. Between them they account for neerly e third of the entire Study Area. Areas formally identified by the local planning authorities es of very high landscape value take in a further 350 square miles. But we were also impressed by the beauty of many other areas of countryside, particularly in Monmouthshire, which, mainly because of the absence of development pressures, do not yet cell for any statutory recognition. We accordingly undertook our own simple landscape survey based on the indentification of some 40 zones eech of which possessed some homogeneity of land form, water ereas and vegetation. These were evaluated, admittedly eubjectively, on a points system and a consensus opinion was derived within the Physical Planning Unit. The areas which we considered to have well ebove average landscape value are included in Map 9.

4.68. The fine scenery which abounds in the Area encourages walking, camping, caravanning, riding and sightseeing. But equally important as a recreetional outlet is the avellability of suitable water ereas. In this the estuery itself hes surprisingly little to offer. While it constitutes a vital element in Severnside landscape it is muddy with a very high tidal range and dangerous currents. In Gloucestershire its attractions are mainly those for the naturalist; in Monmouthshire the coast consists largely of mudflats. Only at Weston-super-Mare do the rock cliffs of Portishead and Clevedon and the North Somerset marshes give way to sandy beaches and dunes. Weston-super-Mare itself is a major seaside resort catering for around 300,000 visitors and 2 million day trippers a year. The coast from here south to Burnham is intensively developed with caravan and holidey camps—probably alreedy to saturation point. We are doubttul whether the estuary can provide much in the way of increesed outlets for mass recreation, though the building of a barrage would chenge all this. On the other hand the whole of the Study Area is within easy motoring distance of the holiday coasts of South Wales and the South West.

4.69. The Area's rivers and inland waterways are, however, all of considerable recreational value. The Severn, Wye, Usk, the Wiltshire Avon end the Upper Thames ere variously used for sailing, rowing, canoeing, cruising end angling and there are suggestions for setting up an Avon Valley Country Park between Bristol end Bath. The three main canals—Gloucester-Sharpness, which is in commercial use, Kennet-Avon and the Monmouthshire-Brecon—are all being studied for recreational potentiel. The Kennet-Avon end Monmouthshire-Brecon in perticular run through areas of great scenic interest. All the main reservoirs in the Study Area—the Chew, Yeo, Cheddar and Llandegfedd—are in fine countryside and are being developed for recreation; so is Llangorse Lake in the Brecon Beacons Netional Park. And on the eastern fringe of the Aree the local euthorities ere developing a 'Regional Water Park' of 4,000 acres in an area of gravel workings at South Cerney in the Upper Thames velley.

4.70. We have not been able to form any estimate of the theoretical 'capacity' of Severnside's potential recreational outlets, nor do we see how eny such estimate could be related to possible levels of local urban growth. This sort of question reises ecute conceptuel difficulties; in fact it may have no real validity except in a more finite context, for example, in the design of holiday accommodation around an isoleted stretch of beech. Our generel conclusion on recreetional potential, and on scenic attractions and neture conservation, is that the Study Area is exceptionally well endowed. It is, therefore, if the economic opportunities are also there, likely to be a very ettractive piece to live. But we would also strongly contend that these netural attrections impose restrictions on the ultimete scale of development that ought to be contemplated. Although we cannot define the meximum population figure which the Study Area as a whole might be expected to accommodate without incurring the costs of eerious losses of amenity and natural environment, we do suggest in Chapter 5 that, with all the restraints we would like to see observed, including these environmentel ones, the totel population which could be accommodated in the Study Area is of the order of 3½ million.

Water resources

4.71. As regards the locetional espects of water supply end drainege we suggest there are four clear objectives:

i the provision of satisfactory end minimum cost supplies of poteble weter;
ii the provision of satisfactory and minimum cost facilities for effluent disposal;

iii the preservation of the amenities which clean rivers afford;

iv the reduction of the flood risks that can be produced downstream of an area of rapid run-off that a built-up area presents.

All these objectives would generally tend to favour regional development strategies which located major urban developments on the lower reeches of the rivers or on estuaries.

4.72. The large towns in the Area rely mainly on surface-water resources for their water supplies. Details of the river systems are shown in Map 11; this map also indicates possible solutions to the related question of how the drainage flows might be arranged from the large areas for development identified in Chapter 5. Cheltenham and Gloucester draw water from the Severn near Tewkesbury. The Severn also provides supplies to Bristol by way of an intake from the Sharpness Canal; Bristol also draws on reservoirs in the Chew and Yeo valleys to the south. intakes on the Usk provide supplies to the Newport and Pontypool areas as well as contributing to Cardiff's sources. The Wye is providing substantial supplies to Birmingham but is a far from fully exploited potential source of clean water. The Bristol Avon is also a potential source but it does contain effluents.

4.73. The sources of the main rivers are generally in areas of high rainfall and the Water Resources Board advise that there is no doubt thet there is sufficient water in this part of the country to sustain major expansion. They also advise that there would be only marginal differences in the costs of bringing water to any of the areas we have identified as suitable for large-scale development.

4.74. The Board's own estimates of future demands, which they have prepared for their current study of Wales end the Midlands, suggest that by the end of the century new resources will have to be found amounting to about 140 million gallons per day for the Study Area as a whole. They are satisfied that the three water undertakings which would be principelly concerned in any Severnside expansion, i.e. the proposed Gwent Water Board, the Bristol Waterworks Company and the North West Gloucestershire Water Board have adequate resources and schemes in hand to meet expected demands into the late 1970s. Well before then decisions will have to be taken on how to secure further supplies. For example there are already proposals to build regulating reservoirs on the Severn and the Usk and to provide a major aquaduct from the Sharpness Canal to a new service reservoir north-east of Bristol.

4.75. The maximum increase in demand which might be associated with the development of all the possible areas we identify in Chapter 5 has been assessed by the Water Resources Board at about 250 million gallons per day. This has been based on an overall per capita consumption of 130 gallons per day in the Monmouthshire part of our Study Area, where consumption is already high, and 100 gallons per day in the rest of the Area. At this level of demand it might become worthwhile considering a Severn barrage scheme or desalination es alternatives to further development of river sources. These are not, however, seen as immediately available options. Barrage schemes, which are discussed later in this chepter, are major civil engineering enterprises involving a range of interests and requiring years of survey and investigation. New sources of water supply will have to be developed well before the estuary could be a major source of supply. As regards desalination this is, and seems likely to be for many years, a relatively very expensive way of providing water in areas such as Severnside where rainfall is in any case adequate, although in the longer term a combination of improved techniques and rising demands for water might make the process economic.

4.76. The Water Resources Board's findings are, therefore, based on the general proposition that development of the Area's river sources is practicable and the most satisfactory way of meeting the water supply needs of eny major expansion on Severnside. The main rivers concerned—the Severn, Wye and Usk—all drain e largely impermeable aree which provides little flow in time of drought, and yields can be increased substantially by building regulating reservoirs in the upper reaches. This also helps with flood prevention and improves the condition of the river by eliminating periods of very low flow. Such storage is already provided on the Severn which is supplying water to the West Midlands as well as to the Study Area. The Llandegfedd Reservoir provides pumped storage in the Usk catchment. No storage provided specifically for river regulation purposes is available on the Wye.

4.77. As far, therefore, as the potential physicel availability of quantities of water is concerned, the areas we suggest in Chapter 5 for future major developments could best be supplied as follows:

i the most probable source for the Monmouthshire coastal plain including Newport-Cwmbran-Pontypool would be the regulated River Usk;

ii the obvious source for the Raglan area is the River Usk but some supplies could, if necessary, be transferred from the Wye;

iii supplies for North Gloucestershire could be obtained by further regulation of the River Severn;

iv It is possible that at some stage the Bristol Avon could be used to augment the existing supply systems for Bristol Severnside, but there would be problems and expense in treatment and the more likely solution could be to increese supplies from the Severn.

4.78. The increased use of the River Severn postulated above pre-supposes that future development in the West Midlands will not produce a deterioration in the quelity of its water, otherwise supplies would have to be drawn from the River Wye in Monmouthshire. From this particular viewpoint it would be better to develop Severnside than to extend the West Midlands conurbation westwards into the Severn basin. Within our own Study Area we point, in Chapter 5, to the difficulties which could arise in this respect with a development on the Usk at Raglan. As regards the Wye, the fact that it is the one virtually completely clean major river in the whole of the Study Area is one of the reasons for not suggesting any major development within its catchment eree.

The estuary

Ports

4.79. The ports of the Severn estuary have played a significant role in the Study Area's economic history. Well placed for the oceanic routes, the port of Bristol, for example, figured prominently in the old triangle of trade between England, West Africa and the Americas. Some of Bristol's early established industries—tobacco and chocolate in particular—originated from this trade. World-wide export and coastel trade outlets for Welsh coal were provided by the South Wales ports, although this coal traffic has much declined from its peek levels.

4.80. The principal ports fall into two main groups—the South Wales ports and Bristel-Avonmouth. In addition, Milford Haven, although outside the Study Area, is an important port mainly concerned with oil traffic. Extensive dredging and the construction of suitable jetties have enabled the port to handle 250,000 ton tankers. Sharpness and Gloucester, on the eastern side of the estuary, are relatively small ports and are engaged mainly in the coastal, Irish and European trade. Sharpness, which has modern container handling facilities, provides an outlet for the British Waterways canal link with Gloucester. The inland eccess to these two ports is not wholly satisfactory but because of the generally rural situation traffic congestion is not a problem.

4.81. The South Wales group of ports comprises Swansea, Port Talbot, Barry, Cardiff and Newport. Only the last named is actually within our Study Area but these ports are regarded by the British Transport Docks Board, by whom they are owned and operated, as a co-ordinated dock system which together provide a range of specialised services in addition to general cargo handling facilities. Thus Port Talbot is highly specialised as an iron ore and iron and steel port; new harbour construction and dredging at the port, at a cost of some £20 million allows scope for further expansion to cater for bulk-carriers of up to 150,000 dwt. Newport hes facilities for peckaged timber and a deep-sea container terminal. Cardiff has a general programme of redevelopment including provision for timber handling in the Queen Alexandra Dock. Swansea has a 'roll-on/roll-off' terminal and e car and passenger ferry service operates to Cork. Eech of these ports hes well-edvanced schemes of rationalisation and modernisation. In addition, statutory powers exist for the building, should the need arise, of an ore terminal at Uskmouth, to serve the British Steel Corporation's Monmouthshire works. Altogether, therefore, there is in being, or in prospect, a range of modern port facilities on the west bank of the estuery with some spare capacity.

4.82. At Bristol some of the original docks close to the old city area have long been abandoned and the Port Authority ere seeking powers by Private Bill[10] to enable them to close the greater part of the City Docks and to concentrate traffic at the deep water docks at Avonmouth. These latter docks, which are relatively small by modern standards, ere hemmed in by industrial and commercial buildings and oil storage tanks. This inhibits large-scele expansion of the docks as well as any substantial growth of container traffic which needs larger landward areas for each berth. Because of this various schemes for developing new deep-water docks on the south side of the Avon at Portbury have been considered. (N.B. In November 1970 Government approval was given for the 'West Dock' scheme of the Bristol Port Authority in this area).

4.83. The Area is well supplied with readily accessible ports which in the past have played a part in the growth of industries and which, more recently, have developed their facilities to meet the specific requirements of particular industries and trades e.g. iron ore and timber. However, our economic essessment suggests that the influence of the ports on the local economy may now be of less general importance. With modern handling equipment they are no longer major employers of labour. Also, most of industrial Britain is within only a few hours' travelling time from at least one port, so an industrial location that is well placed for distribution to home markets may be more important, especially in relation to general cargo, than proximity to a port through which consignments are channelled in only occesional loeds. Indeed, with containerisation the operation of loading or unloading cargo may effectively take place at inland clearance depots located at some distance from the port itself. Perhaps more important again than actuel proximity to a port is the aveilability of frequent scheduled shipping services to e wide variety of destinetions. In this last respect the Severn estuary offers no special advantage. Although generelly well placed for oceanic routes it is not well located to tap the main long-distence shipping routes serving North West Europe; instead Southampton end London are more favourably placed to handle a share of that traffic. Nor can the Severn estuary ports expect more than a small fraction of this country's growing European trade in general cargo which is concentrated on a highly competitive end full range of services from Southampton, the Channel ports, the Themes estuary, the Haven ports and, further north, from the Humber.

4.84. In our essessment, therefore, Severnside's port facilities are edequate to handle existing treffic and offer possibilities for further development to meet future requirements. However, port facilities as such should not be regarded as giving the Study Area special economic advantages over other perts of the country of an order relevant to our Study.

Maritime Industrial Development Areas

4.85. The concept of Maritime Industrial Development Areas (MIDAs) was first put forward by the National Ports Council in their Annual Report of 1966, on the grounds that the close associetion of deep-water port facilities with industriel development offers substantial economic adventages. Deep water is needed to cater for the ever increesing size end draught of vessels now being ueed for

(10) Bristol Corporation Bill.

the carriage of bulk commodities, and at a MIDA such carriers could berth alongside the plants that would use their cargoes and products could be transported outwards by sea. It is argued that in this way industries using imported material could benefit from the cost savings of bulk sea transport and avoid the expense of inland haulage. In turn, secondary industries attracted to the development might benefit from similar advantages and from close association with the primary industries. Industry sited at a MIDA might thus enjoy considerable competitive advantages, both nationally and internationally, over that at less closely integrated sites. A number of sites where such development is physically feasible, in terms of accessibility to deep water and availability of extensive areas of flat land, have already been identified. Among them are two on Severnside—on the Wentlooge and Caldicot Levels on either side of Newport and in North Somerset between Weston-super-Mare and Clevedon. An indication of the general location of these sites is given in Map 12. However, it is only after it has been established whether or not a MIDA development would be a good use of scarce national resources and of real benefit to industry and the country, that decisions on specific locations could be taken.

4.86. The planning and construction of a MIDA would clearly extend over a considerable period of time and if the concept is shown to be economically worthwhile, and a Severnside location is considered the most suitable, it would still be some time in the 1980s before any development could be undertaken. In the main, industries likely to be attracted to a MIDA would, at least in the first instance, be capital-intensive (petrochemicals, steel, etc.) and it would only be later that secondary industries, possibly more labour-intensive, would appear so that substantial employment effects would be very long-term indeed. An assessment of the possible economic impact of a MIDA would thus be largely speculative at present. However, as regards its impact on the suggested location, we feel some anxiety about amenity in North Somerset and the possible risks of air pollution at Clevedon and also at Newport (see para. 5.55). Nevertheless it is clear that potential MIDA sites are scarce and care must be taken to ensure that their potential is not squandered. None of our development proposals would clash with the eventual establishment of a MIDA in the locations that have been suggested.

Barrages

4.87. The physiography of the Bristol Channel and the Severn estuary is such that tidal ranges are the highest in Europe and, after the Bay of Fundy in Nova Scotia, in the world. At spring tides the range, which increases as the estuary funnels towards the English Stones, is about 35 feet at Bridgwater Bay, 40 feet at Weston-super-Mare, 42 feet at Avonmouth and up to a maximum of 50 feet near the Severn Bridge. Inevitably the possibilities for tidal power generation have excited much attention. The first official proposals, associated with Professor Gibson, were published in 1933 and subjected to hydraulic model tests. Since then a number of schemes have been suggested, in particular by Mr Collyns, Mr Burgess, Dr Wilson and Dr Shaw and by consulting engineers Underwood and Snow and W S Atkins and Partners. They renge from the early proposals for a barrage at the English Stones to leviathan-scale two-basin schemes incorporating barrages located as far down the estuary as below Barry and Weston-super-Mare. An illustrative selection of these schemes is shown on Map 12.

4.88. A primary function of most schemes would be to generate electricity although the supporters of a Severn barrage have suggested that it could bring other benefits: these have included improvements to navigation and port facilities, increased supplies of water, a new estuary crossing and improved facilities for recreation end water sports. A barrage has also been linked with proposals for land reclamation for MIDA type developments and for an international airport, but in so far as these possibilities could, it appears, be achieved by reclamation of the Welsh Grounds they would not necessarily depend upon the existence of a barrage for their realisation. Whatever the overall merits of the various schemes maybe it is unlikely that a decision whether or not to build a barrage is going to be taken soon. This was a metter upon which we had to take a view comparatively early on in our study of the Area; accordingly our findings are based on the assumption that there will be no major barrage, at any rate until near the end of the period which we are broadly considering. None of the major developments we consider in later chapters would, however, prejudice any of these schemes.

Broad initial assessment

Industrial land

4.89. Leaving aside any possibilities for MIDA developments, some of the extensive areas of flat land alongside the estuary which are well placed in relation to the main road and rail networks could be suitable for major industries. On the west bank both the Wentlooge and the Caldicot Levels could have a potential in this context. The Caldicot Level in perticular already has the Spencer Steelworks at its western end and to the east, at Portskewett, is a site for a proposed nuclear power station. There is a proposal to provide a deep water dredged channel to Uskmouth. On the east bank the potentially suitable area stretches from Avonmouth to the Severn Bridge (see Map 12). A substantial part of this is owned by ICI who have a major plant at Pilning near Severn Beach. None of this area is directly accessible to deep water and part is within the Bristol green belt.

Urban development

4.90. As far as land for other urban uses is concerned no hard and fast line can be drawn about what areas are, or are not, physically

developable. We have taken the view that over most of our Study Area land above the 500-feet contour is generally unsuitable for lerge-scale urban development. Above this level topographical difficulties tend to increase; also, exposure to strong winds and high rainfall reduce the attractiveness of these areas for urban use. We have also regarded as unsultable a few ereas where, although tha land is below 500 feet, there is e high incidence of slopes steeper than 1 in 10. Although the existence of a few steep slopes is no real obstacle, where these are a high proportion of the total surface they can lead to an increase in civil engineering costs end be en inconvenience to urban life. We heve also treated the best landscape areas as permanently safeguarded features because we believe that es the country's population gets even larger end es its living and cultural standards rise, the value placed upon these natural assets will increase. By and large the Area's high amenity areas in eny case tend to be coincident with the erees we would class as topogrephically difficult to develop.

4.91. Leaving eside these areas and the already developed main urban areas we therefore took as our main areas of search for large-scale development opportunities the following broad areas:

The Bristol Area

Beyond the Cotswolds end the Mendips there are ereas which may well be physically suitable for lerge-scale building. These would include the upper Themes Valley, the upper Avon and the Somerset Frome Valleys, and the Axe and Parrett basins. But all thase stretch well away from the heart of our Area, so we confined our investigations to areas west of the line of the Cotswolds scarp and north of the Mendips. Our areas of search here comprised two separate localities:

i Bristol Severnside including part of the Vale of Berkeley and the Valley of the Bristol Frome (the dividing line between this area end our lower Severn Valley area has been taken es the point where the Vale of Berkeley narrows between Stinchcombe Hill and the Gloucester and Berkeley Canal);

ii the aree around Weston-super-Mare.

The Lower Severn Valley

This eree is contiguous with apparently extensive devalopable areas stretching north-eastwards to the Vale of Evesham and northwards to Worcester and beyond, thereby, incidentally, holding out some possibilities for a linear form of development linking with the West Midlands. For our Study purposes we have taken the line of the M50 as our northern limit between the Malvern Hills and Bredon Hill. Similerly, to the north-west an area of search is contiguous with possible areas based on Hereford and on Ross-on-Wye. Here we have limited our investigations to the catchmant area of the River Leadon. At two points, the Eldersfield aree in Worcestershire and Trumpet in Herefordshire, the physical areas of seerch were teken slightly beyond the boundaries of the Study Area as defined in terms of local authority areas. The search areas in the lower Severn Valley, as here identified fall naturally into two:

i the east bank of the Severn, comprising the erea around Tewkesbury, Cheltenhem and Gloucester and the northern end of the Vele of Berkeley;

ii the west benk of the Severn and the valley of the River Leedon.

Lowland South-East Wales

This broad araa falls into two distinct perta:

i the coastel plain whlch stretches west from Chepstow (for conservetion reasons we heve excluded this town from our major area of search). It includes the Afon Llwyd Valley stretching up to Pontypool and, physically, extends west beyond our Area to Bridgend. This area of Glamorgan has been the subject of studies by Colin Buchanan and Partners on the developmant possibilities of the Llantrisant aree commissioned by the Welsh Office[11], and on Cardiff, commissioned by the City[12];

ii an area of North Monmouthshire in the general area of Raglan.

The Wye Basin

Our area of search is mainly based on Ross-on-Wye. Although the valley of the River Gamber would also appear to offer physical possibilities it is small for our purposes and, in any cese, oriented mainly towerds Hereford. We heve excluded it from our consideration as being only peripheral to Severnside.

(11) Llantrisant—Prospects for Urban Growth (1969) by Colin Buchanan and Partners.

(12) Cardiff Development and Transportation Study (1966 and 1966) Colin Buchanan and Partners.

Conclusions

4.92. To sum up, the Study Area already hes a developing city region-type structure besed on three main urban areas. It hes the locational advantages of being extremely well placed in the country's existing and progremmed motorway network and it has good inter-city rail services. It elso has several important ports, some with spare capacity.

4.93. In terms of physlcal envlronment the Area has the considerable advantage of a mild climate and, apart from some hill arees, does not have a high rainfall. It possesses wide arees of some of the best scenery in the country and is well endowed with places of architectural and historic interest. Much of the Area has recognised tourist and holiday ettractions. Almost ell parts are within easy reach of well-esteblished shopping and enterteinment centres at Bristol, Beth, Cheltenham, Gloucester, Newport and Cardiff. Higher education facilities are well developed with universities at

Bristol, Bath and Cardiff. Altogether, there is no doubt that the Area as a whole is widely acceptable as one in which to live. Evidence on recent migration movement confirms that people are attracted from all parts of the country. Even after making generous allowances for excluding from urban use the better landscape areas, highland and other land involving topographical difficulties, the areas of search were still very wide. The main possibilities for major urban expansion within them are examined in the next chapter.

Annex 4A

Definitions of areas used in the tables

Table	Area		Constituent areas
4c	Bristol	Central Area	Statistical zones*: 32, 35-37
		Urban Area	,, ,, 30-43
	Newport	Central Area	,, ,, 127, 128
		Urban Area	,, ,, 127-130
	Gloucester	Central Area	,, ,, 62, 65, 67
		Urban Area	,, ,, 61-63, 65-67, 74, 79
	Bath	Central Area	,, ,, 19
		Urban Area	,, ,, 16, 17, 19
	Cheltenham	Central Area	,, ,, 76, 80, 81
		Urban Area	,, ,, 74-76, 79-82
4d	Bristol		Bristol CB, Kingswood UD, Mangotsfield UD, part Sodbury RD, Stoke Gifford and Filton parishes.
	Cardiff		Cardiff CB, part Cardiff RD, Radyr, St Fagans, and Whitchurch parishes.
	Newport		Newport CB, Caerleon UD.
	Gloucester		Gloucester CB, part Gloucester RD, Longlevens, Churchdown, Hempsted, Barnwood, Hucclecote and Brockworth parishes.
	Cheltenham		Cheltenham MB, Charlton Kings UD, part Cheltenham RD, Prestbury parish.
	Bath		Bath CB.
	Weston-super-Mare		Weston-super-Mare MB.
4e and 4f	Bristol		Statistical zones*: 7, 30-43
	Cardiff		,, ,, 106, 109-112
	Newport		,, ,, 116, 126-130
	Gloucester		,, ,, 62-67
	Cheltenham		,, ,, 75, 76, 79-82
	Bath		,, ,, 19
	Stroud Valley		,, ,, 70, 71
	Pontypool		,, ,, 117
	Cwmbran		,, ,, 118
	Weston-super-Mare		,, ,, 27
4g	Bristol		Bristol CB, Kingswood UD, Mangotsfield UD.
	Bath		Bath CB.
	Cheltenham		Cheltenham MB, Charlton Kings UD.
	Gloucester		Gloucester CB.
	Cotswolds		Cirencester UD and RD, Northleach RD, and North Cotswolds RD.
	Stroud Valley		Nailsworth UD, Stroud UD and RD, Dursley RD and Tetbury RD.
	Forest		East Dean RD, Lydney RD, West Dean RD.
	Newport		Newport CB, Caerleon UD.
	N. Monmouthshire-Ross		Abergavenny MB and RD, Monmouth MB and RD, Ross-on-Wye UD and Ross and Whitchurch RD.

* See Map 1.

5 LAND FOR LARGE-SCALE DEVELOPMENT

Introduction

5.1. Within each of the broadly defined areas of search identified in para. 4.91 we carried out a detailed three-stage analysis and synthesis of the physical factors which would influence the selection of areas for large-scale development. The areas which have emerged are not the only ones that could be built on. It is always possible, at a cost, to tackle difficult sites where social and economic pressures make this necessary and modern foundation preparation and drainage techniques make the task much easier. Similarly, with higher expenditure on, say, heating and transportation, it becomes possible to consider development on high and exposed sites. However, in this feasibility Study we have concerned ourselves with land availability as a primary locational factor and thus we have looked only for large sites where construction should be cheap in real resource terms and where the environment is hospitable.

The selection process

Stage 1

5.2. For our initial analysis, designed to locate those sites which seemed favourable for large-scale development, we carried out a conventional sieving of the physical factors involved. Some of these, for example areas of grade 1 and 2 agricultural land, commercially valuable mineral reserves, nature conservation areas and landscape, have been dealt with in Chapter 4. In addition we generally ruled out for purposes of large-scale residential development land which floods, or has a water table very near the surface, or which is below the level of high tides. In some well-placed areas, especially near Gloucester and Cheltenham, the implications of carrying out extensive drainage improvements were however examined. We also had to take into account a number of 'rural land allocations', a phrase coined to cover a variety of uses to which the countryside is put which in some degree inhibit large-scale building. They include gathering-grounds for water supplies, commons, recreation areas, and Forestry Commission land.

5.3. We also encountered a number of man-made restraints which call for some general comment. The needs of our urban society are producing increasingly complicated space requirements which are, often insidiously, eroding our freedom of choice for providing new living areas. These 'safeguarded' areas include lines for major new roads, flight-paths for airfields, security protection areas for defence establishments, safety areas for nuclear power plants, wayleaves for major gas, oil, water and other pipelines, electricity transmission lines, both overhead and underground, and areas liable to suffer air pollution from industrial processes. The inherent difficulties facing a land-use planning system in acknowledging that significant areas of land, other than those already allocated in a development plan, might eventually be needed for building may have induced statutory undertakers, and others, to festoon with supply lines what could be potential building land. The maze of services north of Bristol (see Map 13) may now constitute a complication to development in that direction. We would hope that one outcome of attempting to define longer-term development strategies could be to highlight possibilities for defining 'corridors' which could be set aside for major services and communication routes.

5.4 We were unable to devise any method of systematically evaluating all the factors that led at the end of stage 1 of our investigations to our initial choice of possible sites for future development. For example, not only is it difficult to find a common basis for comparing the current commercial value of a mineral deposit with the aesthetic pleasure derived by people who admire a landscape, but there is the added complication of attempting to place a value on an asset of permanent value which once destroyed, could never be replaced in the same form. The simple financial concept of 'present value' used in cost/benefit analysis does not seem to us to embrace the social responsibilities which we must surely

accept for conserving for succeeding generations such assets as the natural beauty of the Mendips. We have therefore felt compelled to rely on value judgements for this part of our exercise. We have however left our data on record, mainly in map form, so that subsequant planners may make their own appraisals.

Stage 2

5.5. The second stage was to examine the feasibility of providing the salected locations with sewerage. A check was also made, using available geological data, on the stability of these areas for building purposes. Outline schemes for dealing with foul sewage and surface water were prepared using an assumed overall population density of 18 persons per ecre. In e number of places minor edjustments of tha boundaries of the potential building areas were made to secure more economical drainage. It was also possible to obtain an assessment of the relative costs of trunk sewerage and sewage treatment for each of the areas examined. This was based on those elements which depend on locetion, for example standards of treatment required, distence from water courses of adequate capacity to accept surface weter and sewage effluent (see Map 11). It was not possible to derive precisa estimates of totel costs because the costs of a number of items in a drainage scheme are influenced by the design and layout finally adopted for the development itsalf. It did appear however, that although in sevarel cases radical solutions would be needed to deal with drainage problems, for example by way of major surface-water transfer from one catchment to another, these need not involve unusually high per capita costs so long as the development they would serve was on a large scale. The possible new areas for building that we derived by these processes are identified in Map 14 as are the possible estuarial sites for large-scale industry referred to in para. 4.89.

Stage 3

5.6. At the third stage we examined the relationship of these possible new building areas to existing towns and villages, to existing plans for these, and to existing and possible lines of communication. An assessment was made of the character of those villages and small towns which fringe the new areas and, in consequence some boundaries were re-drawn. A high proportion of the potential building land occurred near large towns and an appraisal was made of the urban fabric and structure of Bristol, Gloucester, Cheltenham and Newport in order to obtain an indication of the scope for the re-modelling which would become necessary under the impact of large additional populations within reach of those towns' facilities. In particular the feasibility of providing communication links between the new areas and the existing towns, and into the existing town centres, was investigated. We satisfiad ourselves that as far as the new areas we are putting forward for consideration are concerned, routes for any new road links are available. These routes have not baen accurataly surveyed but they were reconnoitred in sufficient detail, with linear profiles prepared in difficult country, for us to identify 'corridors of opportunity'—not necessarily the best ones but certainly feasible ones. We deducted the size of the arees which the corridors for possible major roads might absorb from our estimates of developeble lend availability and indeed we eliminated from consideration some areas which would be dissected by existing and possible new routes. We must stress that we did not attempt to define the lines of roads that will actually be needed if large-scale development is to go ahead; nor are we in a position to suggest that any of the 'corridors' that we have identified for Study purposas should be formally reserved as such. But parts of Severnside are developing and re-developing very fast and we believe that if expansion is to go ehead successfully it will be necessary for the executive authorities to act quickly in investigating, fixing and formally protecting the key routes that will be needed to serve whatever patterns of development are ultimately decided upon.

5.7. Our final selection is fourteen large sites which we think offer the best physical possibilities for carrying out large-scale urban development, together with two estuarial sites, at Caldicot and Avonmouth, for possible major industrial development. Their general location is shown in Map 21. These sites and the broad areas where they lie are described and assessed in the rest of this Chapter. In some cases they include land which is part of en existing statutory green belt. This does not in any way imply that we think there is any immediate case for modification; the present green belts are vital components of the Study Area's current development plans. We, however, have been required to explore the possibilities for growth on a scale which could make necessary some changes in the long-term direction of the development strategies for parts of the area. This we assumed did not exclude changes in the green belt system, although any changes must be very carefully weighed.

Bristol-Bath

Development plans

5.8. In 1966 the Bristol-Bath sub-area had a population of 892,000, about 540,000 (over 60 per cent) of whom lived in Bristol and its immediately adjoining urban areas. Another 40,000 lived in areas to the north-east of Bristol, mainly in a discontinuous tongue of surburban development beyond the M4 motorway stretching through Winterbourne and Frampton Cotterell to Yate and Chipping Sodbury. Nearly 200,000 (about 22 per cent) lived outside our main areas of search—for example in the Cotswolds, the Mendips and the Failand Hills; half of these were in Bath and its surrounding areas.

5.9. The central aim of current planning policies is to contain the growth of the built-up area

of Bristol within an encircling green belt on the general proposition that the city is already large enough. Similar restrictions have also been applied to Bath with the intention of conserving its unique character and maintaining its high standing in the hierarchy of English historic towns. The main development outlets so far planned are:

i a new town-type of development being built at Yate alongside the village of Chipping Sodbury;

ii some expansion of the former small country town of Thornbury in the Vale of Berkeley;

iii a mainly dormitory development at Nailsea, which lies below the Failand Hills where a relatiyeiy restricted area of ground rises slightly above the wet and low-iying areas which here stretch inland from the coast between Clevedon and Weston-super-Mare;

iv some mainly eastward growth of Weston-super-Mare where there is a small Town Development Act scheme linked with Birmingham.

We estimate that the total provision so far made at these four places might accommodate about 50,000 persons. A similar number might be accommodated within the limited capacity remaining in Bristol and Bath and by wey of varlous planning permissions and commitments spread very widely among the small towns and villages over the rest of the area. A generai picture of the pattern of development at present proposed is given in Map 15, and summarised in terms of population distribution, in columns 2 and 3 of Table 5a on page 46. The possibility of some amendment to these development plans as a result of our Study was provided for by the Written Statement of the review of the Gloucestershire County Development Plan which noted 'although no part of this Development Plan extends beyond 1981 some of its proposals and long-term implications may be affected by the outcome of the Severnside Study'.

The longer term

The Bristol area

5.10. To the south-west the city of Bristol is sherply defined by the spectacular barrier of the Avon gorge. Across the river the attractive well-wooded Failand Hills with Ashton Park, owned by the Bristol Corporation, and the National Trust's Leigh Woods are within the Bristol green belt. Further downstreem, opposite Avonmouth most of the Gordano Valley is defined as of great landscape value. Up-river of the gorge, Bristol has spread southwards over the flat valley floor with development currently extending to the foot of Dundry Hill. The limits of possible development here heve been carefully defined so as not to overtop the view of the crest which forms a charecteristic part of the outlook from Bristol to the south. We feel that the whole of the presently defined southern boundary of Bristol's urban area has a strong physical reality. One important feature ie that many well-known parts of Bristol—the city centre, the University quarter, Clifton—enjoy glimpses deep into the open Somerset countryside. We have formed the impression that this contributes much to the image of Bristol as a metropolitan city which hes the country at its door step. On these counts we would not want to see the green belt south of Bristol disturbed.

5.11. We also think it important to meintain the present green belt on the eastern side of Bristol, covering an area extending at least as far northwards as the barrier presented by the M4 motorway. At present this part of the green belt is helping to restrain pressures on the alreedy strained commuter network in east Bristol. In addition it not only protects the scerp slope of the Cotswolds and the attractive valleys of the Avon and its tributaries, which are valuable foreground features, but also forms an essential element in the policy for containing the urban pressures on Bath.

5.12. To the west and north-west, beyond the ridge which stretches roughly along the line Henbury to Almondsbury, the lend falle to the extensive flat areas which back the estuary northwards from Avonmouth. Much of these areas is very near high tide levels with lend drainage controlled through tidal flaps. While unattractive for residential purposes they offer valuable sites for the mainly capital-intensive industries. There are already major chemicel, zinc smelting and gas conversion plants as well as oil storage installations established in the area. A considerable potential in terms of iand area—altogether perhaps some 6,500 acres—remains. We think that nothing should be done which might prejudice the ultimate realisation of this asset. To this end, sites in this location ought not to be allocated to industrial and commercial uses which could go elsewhere. In any case convenience for journey-to-work points to labour-intensive activities being better placed nearer the centre of gravity of existing and future urban areas. Areas surrounding such potential major industrial sites should be kept free of residential incursions which could inhibit some types of large-scale industrial development because of the risk of air poliution. Accordingly, we would not regard as available for major residential developments any of the area south of the M4 motorway and west of the M5. This would yield the further advantage that it would keep the take-off flight-path from Filton free of development.

5.13. On this analysis a decision to adopt the Bristol area as a major growth erea would imply that the main new urban ereas would have to be to the north of the city. Although there is some land between Patchway and Stoke Gifford and the M4 motorway which might be developed, for the most part any major new possibilities will have to be beyond the line of the M4. The area here is bounded by the motorway, the Cotswold scarp and the estuary and extends north to the point where possible developeble land is squeezed between Stinchcombe Hill end the low lying area at Slimbridge. The southern part of this area of search lies within the Bristol green belt.

5.14. It falls naturally into three parts:

i e central eree lying between the proposed M5 motorway and the Liassic scarp and mainly comprising the Frome Valley together with, in the north, part of the valley of the Little Avon;

ii the Liassic platform which extends along the foot of the Cotswold scarp. Its western boundary is generally marked by a low west-facing scarp which runs roughly parallel with the Cotswolds on a line which passes between Chipping Sodbury end Yate;

iii the Vale of Berkeley, which in this context we can define as comprising the area west of the

line of the proposed M5 motorway and lying north of the M4.

5.15. The largest area of physically suitable devalopabla land is located in the Frome Vallay, the natural drainage from which is through Bristol where the river is culverted under the city centre. Flood waters are intercepted upstream and tunnelled direct to the River Avon whilst the remainder discharges into the Floating Harbour. Foul sewaga is similarly tunnelled and then pumped to the treatmant works at Avonmouth. We are advised that development already committed in this catchment area, particularly at Yate, stretches existing capacities to the limit. Largar developments in this area will call for a radically new drainage systam. A solution we have explored is to tunnel through the ridge which separates the area from the main Severn valley to take foul and surface-water drainage to the estuary. The terrain is geologically difficult and, although sewage treatment costs at a works on the estuary would be low, the schema would be initially expensive and would probably only be justified if a vary large expansion were to take place. This drainage problem is a significant threshold and we think the issue should be settled early on. In the absence of a decision, development will, in the relatively short term, hava to be steered away from this catchment area, perhaps to areas which would not have been developed at all if it were known in advance that expansion would eventually be taking place in the Frome Valley. Once the decision has been taken to proceed it is possible that short-term relief could be obtained by constructing balancing ponds on the Frome.

5.16. The area contains proven reserves of limestone, celestite and coal. The limestone is of high quality and will be in greater demand if major expansion takes place on Severnside. The workings are deep and cannot be reclaimed for development. We have defined our suggested area for development to avoid the main existing and possible quarrying areas which are in the Yate, Wickwar and Charfield areas. Celestite presents a less clear cut problem. We have come to the conclusion (para. 4.61) that these deposits are not a bar to development but as the gross yield per acre appears to be of the order of £15,000 prior extraction should be worthwhile. We are examining a very large area where any development would have to be spread over many years so there should be opportunities for programming. There is also scope with such a major new development to locate open space uses on celestite areas that may in due course have to be disturbed and reinstated. The existence of coal is not a fundamental problem. There are not likely to be any new workings and the question of the stability of areas of old mainly shallow workings is a familiar one in this locality and one that is normally dealt with by detailed survey at the time of development.

5.17. None of this area of search has been statutorily identified as of high landscape value but our own survey rated highly the Little Avon Valley. Development as far northwards as this would also mean moving into another drainage area. We have accordingly kept our suggested araa mainly to the Froma basin.

5.18. Because the area has never been officially considered for development parts of it are traversed by a complex network of utility services (see Map 13) which will pose a number of detailed design problems. In the case of electricity there is a web of transmission lines focusing on the switching station at Iron Acton. This is cleverly sited so that the present impact of this concentration upon the countryside is astonishingly small. Its existenca would, however, rule out its surrounding area for residential development. But the switching station could be incorporated within a major new industrial estate, the need for which would certainly arise with any massive increase of population in the area.

5.19. The south-western part of our suggested area, especially at Patchway and Stoke Gifford, lies near the British Aircraft Corporation's establishment at Filton. The airfield is not likely to become a civil airport and the present uses of the runway, for example for 'taxi' services within tha firm's own organisetion, are no problem. If Concorde is successful there could be several take-offs a week of completed planes. This would invariably be a daytime operation and in any case the take-off would be to the west away from our choicas of possible new residential araas. Flight testing will be carried out elsewhere and although, presumably, some aircraft will have to return to Filton the disturbance could be nothing approaching that associated with a commercial airport. Engine testing, even with sound mufflers, can be a noisy affair but this is now taking place; and there are already considerable residential areas, many of them recent, much nearer to the factory than any areas we are now proposing. We think, tharefore, that Filton will not inhibit the development of these areas which will, on the other hand, be well placed for any employment opportunities in the Filton area. We would not however put forward any land at Patchway or Stoke Gifford as suitable for high-rise housing. We would also suggest that the eastern flight-path approach be mainly used for open-space purposes.

5.20. As regards the pattern of communications, the existing road plans for Bristol County Borough are based on the assumption that the rate of growth of traffic will be the same in all directions. The plan is for a radial system with three major ring roads—an Inner Circuit within the central area, an Outer Circuit acting as a by-pass and a distributor for the central area, and a Ring Road near the city boundary. In addition an Intermediate Ring Road has been proposed between the Outer Circuit and the Ring Road. Beyond the Inner Circuit Road, improvements to at least dual two-lane standard are planned for the existing main radials. Some of the important shopping areas on the existing radials will be bypassed. One completely new radial—the Parkway linking the Outer Circuit Road to the M4—is under construction and one of its three sections was opened in July 1970. There are plans to link it to the Inner Circuit Road. There is a strong underlying presumption that a considerable proportion of total traval will be by bus and that a balance will be maintained between road capacities and car parking facilities. If, as we are now suggesting, major growth is concentrated in one sector only, some modifications of present ideas will be called for and we have explored routes for two new roads on the north side of the city. If these could be built to urban motorway standards they would substantially augment the capacity of the currently

planned radials. Finally, we think there might be some advantage in building a new main railway station on the stretch of line between Stoke Gifford end Westerleigh Junction.

5.21. The transportation difficulties could obviously be reduced if the new areas north of the M4 could be successfully provided with most of their besic service and employment requirements. There is at least e possibility that this could be done as far as shopping is concerned because, as noted in para. 4.5, Bristol's main shopping facilities are already somewhat dispersed and the city centre image relies heavily on its entertainment, cultural and office functions. if large-scale development north of Bristol were programmed to start in areas east of tha River Frome its new services could be based upon the already significantly large population living in what are at present almost entirely residential districts in Winterbourne and Frampton Cotterell. This might provide favourable circumstances for a new shopping centre to get off the ground. We suggest, for example, that somewhere between Rangeworthy and Iron Acton might be a suitable location, leaving the existing new centre at Yate to grow to at least its present plenned size as a district centre.

5.22. Whether a new centre could also attract extensive office development is less certain. But it would become a prime location within a vary large city and would be easily accessible to the motorway system. The position in Bristol itself will also be changing. A continuing growth of office and other employment in the 1970s will, with the present road progremme, mean that office workers in the city centre will have to rely increasingly on buses. One solution might be the development of offices off-centre at Temple Meads station, but there are virtually no rail commuter services and, as far as we can see, very little prospect that these could ever develop to a level where they could significantly affect the travel-to-work problem. Also, although Temple Meads enjoys the Inter-city services, it is some distance from the existing prestige office sites which are naturally near the main shops, entertainments and hotels. Some offices in Bristol may well, therefore, seek to expand outside the present city area.

5.23. It is improbable that a new centre or centres could ever rival the established and considerable entertainment and cultural attractions of the historic centre. We have the impression that this could survive and flourish as the heart of an enlarged city.

5.24. Altogether, in spite of the difficulties, we believe large-scale development could be undertaken in an extensive area north of Bristol. We have defined an area of 18,000 acres and labelled it Frampton Cotterell. At our assumed overall density of 18 persons per acre it could accommodate 330,000 persons. This must be regarded as, in effect, the northward growth of Bristol to become eventually a city of over 800,000 population.

5.25. To carry through e detailed study of the implications of such a lerge city expansion, to devise and evaluate alternative plans and policies and to produce a definitive solution will require a major exercise in detailed urban planning.

5.26. The Liassic deposits which form a gently undulating plateau at the foot of the Cotswold scarp have levels generally between 300 and 450 feet above sea level. They are certainly developable but extensive building would intrude very conspicuously into the foreground of views from the Cotswolds. For this reason, and because of the incidence of common lands, woods and water-gathering grounds, we would not put forward for consideration any of the land north of Chipping Sodbury. We have, however, defined one possible area for development at Wapley. This has the short-term advantage that most of it drains to the River Boyd and not to the overloaded Frome Valley, though were it to be developed in conjunction with our major new area at Frampton Cotterell it is probable that its drainage would be taken to a Frome Valley system as indicated in Mep 11.

5.27. The flat floor of the Vale of Berkeley is low-lying and wet, but the slopes which comprise its eastern sections are attractive undulating areas with patches of high-quality agricultural land and many fine trees. Even with its nuclear power stations, the vale retains a rare pastoral quality with its rural views enlivened by glimpses of the estuary end backed by the hill country beyond the Severn and with the historical associations of Berkeley Castle.

5.28. We have explored the possibilities for development in the area of Sharpness and Berkeley. This is nicely pleced near the main railway and motorway between Gloucester and Bristol. Any large-scale residential development here, howevar, would not be accaptable on safeguarding grounds until the nuclear power station at Berkeley is taken out of service. We do not know when this will be, but the station was commissioned in 1962 with an estimeted minimum life of 20 yeers, which could be extended if operation of the station continued to be satisfactory and economic. But for the power station, it would be feasible to build a free-standing town of about 60,000 population at this very attractive location (see Map 14). Development here could also open the possibility of providing an additional Severn crossing on or near the line of the former railway bridge, which would provide economic benefits for the Forest of Dean where the topography offers no scope for major urban expansion.

5.29. This development must clearly be regarded as a long-term possibility only, but we have been able to define a limited area around Thornbury where the numbers which could be accommodated would be within the already agreed acceptable safety limits for development in the vicinity of the nuclear power station at Oldbury. Even this scale of expansion is proportionately very large and we have some doubts whether the character of the town could successfully survive it. On the other hand the site is environmentally very attractive; with easy falls to the nearby estuary sewerage and sewage disposal would be cheap; and the town is potentially conveniently placed for journey-to-work to Avonmouth and adjoining possible industrial areas.

The Weston area

5.30. South of Bristol we located an area of search beyond the green belt and extending to Weston-super-Mare. It is hemmed in by the proposed Mendips Area of Outstanding Natural Beauty and by areas of high landscape value.

Apart from a relatively large island of higher land at Nailsea and land at Worlebury Hill and behind the beach at Weston-super-Mare, most of this is below high tide level. There is a strip of development at Yatton and a few tiny settlements at one or two spots where the land rises slightly above the general level. The area is interspersed with numerous watercourses with outlets controlled by tidal flaps and the water table is very close to the surface. We have concluded that this area does not offer positive physical advantage for large-scale growth. We would certainly not wish to rule out further expansions at Nailsea and at Weston-super-Mare but we would suggest that these developments would be on a scale which would leave them wholly within the province of the local planning authority.

Summary: Bristol-Bath

5.31. Of the possible new sites we have discussed by far and away the largest, which we have labelled Frampton Cotterell, would constitute in effect a major expansion of Bristol. Wapley could provide for a continuation of that expansion; though if it were developed without the Frampton Cotterell site it could be regarded as a further development of that already begun at Yate. The Thornbury site is relatively small and would cater for some peripheral expansion beyond that already agreed for the town. Substantial areas of flat land lying between Avonmouth and the Severn Bridge could be available for major industries. These areas are identified in Map 16. A substantial proportion of the two larger sites is within the Bristol green belt and development here would represent a departure from present local planning policies which treat Bristol as a city which has already grown large enough. In no circumstances should those sectors of the green belt which safeguard the open country between Bristol and Bath and the Cotswolds edge be disturbed; and we take the same view as regards the attractive Somerset countryside south of Bristol. In looking at development possibilities in the northern sector where landscape considerations are less important we have been influenced by the fact that any opening up of alternative areas beyond the green belt would bring development into much more attractive countryside which we would not like to see disturbed. We were asked to examine the possibilities of large-scale growth: as far as the Bristol area is concerned our judgement is that the best opportunities would involve a re-alignment of the northern sector of the green belt. The advantages of a green belt could be retained by, for example, extending the green belt around our Frampton Cotterell area to include the Vale of Berkeley around Thornbury and the Little Avon Valley.

5.32. Elsewhere in the sub-area the only sizeable possibilities appear to be at Weston-super-Mare. We have regarded Bath, for which a long-term plan has been prepared by Professor Buchanan[13] primarily as a conservation town and we have sought to keep growth away from it. It could well be that over the next 20-30 years growth associated with Bath would have to be diverted—for example to West Wiltshire.

5.33. In Table 5a we present a consolidated account of the physical possibilities in terms of population, covering:

i distribution of population in 1966;
ii estimates of the changes provided for by current development plans, policies and commitments;
iii the capacity, at assumed population densities, of the three new areas we have selected for consideration (i.e. excluding the Berkeley site);
iv an allowance representing our judgement of the approximate number of persons it might be reasonable for areas outside our areas of search to accommodate in the long term.

The crude total of these items amounts to 575,000.

(13) Bath: A Study in Conservation (HMSO 1968).

Table 5a

Bristol-Bath: estimated capacities of selected developable areas

'000

Area*	Population 1966	Development plans, etc.	Other possibilities: Major new sites†	Other possibilities: Allowance for other areas	Total capacity for change (Cols. 3, 4 and 5)
(1)	(2)	(3)	(4)	(5)	(6)
Bristol-Bath	**892**	**99**	**408**	**68**	**575**
Bristol Severnside	618	46	408	6	460
Bristol	540	10	—	—	10
Frampton Cotterell-Yate	44	18	—	—	349
Frampton Cotterell	—	—	331	—	
Vale of Berkeley	24	9	—	3	27
Thornbury	—	—	15	—	
Cotswold fringe	10	9	—	3	74
Wapley	—	—	62	—	
Weston	75	25	—	40	65
Outside Areas of Search	199	28	—	22	50
Bath area	98	8	—	2	10
Rest of N. Somerset	101	20	—	20	40

* For definition of areas (other than those in column 4) see Annex 5A.
† See Map 16.

North Gloucestershire

Development plans

5.34. In 1966 the North Gloucestershire sub-area had a population of 452,000. Over 180,000 (about 40 per cent of the total) were widely distributed in small towns and villages in the Cotswolds, the Stroud valleys and the Forest of Dean where there is little scope for introducing large-scale urban developments. Nearly 270,000 live within the areas we have identified as our main areas of search in the Severn and Leadon valleys. Over 250,000 of these live on the already fairly heavily urbanised east bank of the Severn—mainly in Gloucester and Cheltenham. The west bank and the Leadon Valley have remained thinly populated.

5.35. Current planning policies aim at maintaining Gloucester and Cheltenham as two separate towns and the area between them has been statutorily defined as green belt. The total population growth provided for in the sub-areas is estimated at about 80,000. Only 30,000 is accounted for by peripheral expansions of the two main towns, the overall policy being slanted towards dispersal. The largest element of growth, amounting to an estimated 40,000 population, is intended for Tewkesbury, the Stroud valleys, the mouths of the Stroud valleys and various small settlements between the Cotswold scarp and the Severn. The bulk of the remainder is allocated to the small towns of the Forest of Dean and the Cotswolds; very little development is proposed for the west bank of the Severn and the Leadon Valley. A general picture of the pattern of development under present policies is given in Map 17, and summarised in terms of population distribution in columns 2 and 3 of Table 5b on page 49.

The longer term

The east bank of the Severn

5.36. Cheltenham is hemmed in to the east and south-east by the scarp slopes of the Cotswolds. Northwards, development has been inhibited by the flood plain of the River Swilgate. Most inter-war and post-war building has been to the west and south-west in the Hester's Way and Hatherley areas together with some expansion north-eastwards towards Prestbury.

5.37. We explored the possibilities for subatantial further expansion in these directions with development eventually linking to an expanded Gloucester and extending northwards as far as Fiddington. The outcome of such a scheme would be to produce a massive new linear city on the east bank. We think it would be feasible to devise ways of doing this but, as far as the Cheltenham area is concerned, tha idea did not finally commend itself for the following reasons:

i it is extremely important to restrain the growth of Cheltenham in order to increase the chances of conserving its unique character. From our particular point of view the continued existence of a town and centre with the character and class which Cheltenham possesses represents a significant specialist attraction factor for regional growth;

ii recent growth of Cheltenham to the west and south-west has been contained by the green belt and the new housing areas have been built in this context. There is little scope for building new radial roads through them and the existing ones—the A40 and the A46—have a limited potential capacity in the context of development of the scale we are considering;

iii the area between the line of the M5 and Cheltenham is already crossed by the main railway line and by the A40 with its Golden Valley bypass and additional east-west links would be required with major expansion—thesa would seriously interfere with the layout of a large urban development. So would the existence of Cheltenham Borough Council's large sewage disposal works at Haydon;

iv expansion, particularly to the north, would affect possible workable reserves of sand and gravel;

v extensive davelopment northwards would call for a major scheme for surface-water drainage at an early stage. The area drains naturally to the Swilgate which floods frequently, and without remedial works any significant development could cause trouble especially at Tewkesbury. One solution would be to drain the area directly westward to the Severn using the Coombe Hill canal, although the latter comprises a site of Special Scientific Interest which would be drastically disturbed by channel improvements and greatly increased flows;

vi there are adequate alternative areas for building in the lower Severn Vallay.

5.38. With any large development in this part of the Study Area our preference would be for an attempt to stabilise the function of Cheltenham with the land between it and the proposed M5 motorway retained as green belt. With the increase in general traffic which will come with expansion it is important to provide a new A40 route which will bypass the town. This will be difficult and is likely to lead to soma local disturbance; but we think a solution is feasible and have, for example, investigated a possible route south of the town. Local redevelopment proposals incorporating an inner relief road on the east side of and very close to the town centre aroused controversy, and there could be a case for considering a westerly alignment for such a road, perhaps making some use of the Stratford railway if this were ever abandoned. With such a policy for the town the only scope for growth beyond that provided for in the current development plan would be a limited extension in a northerly direction. The pracise size of any such accretion would have to be determined locally. The thresholds would be the point at which naw major surface-water disposal arrangements were deemed to be necessary and the impact on the road pattern particularly in the northern sector of the town centre. Once these limits have been datarmined the green belt, which at present only affects the south-west sector of the town might appropriately be extended all round Cheltenham.

5.39. As a corollary to the view we formed on the long-term future of Cheltenham we believe that Gloucester should not expand eastwards

beyond the proposed M5 motorway. There are also two obvious features to be excluded from development—Churchdown Hill and Robinswood Hill. One result of such restrictions would be to preserve the Cotswold scerp and its foreground. To the west Gloucester is conteined by the floodplain of the Severn. Development from the original Roman cross-roads nucleus has been mainly southwards with industry on the west side mostly along the banks of the Sharpness Canal. Some more recent developments have departed from the predominantly north-south pattern by spreading eastwards along and between the roads to Cheltenham, Cirencester and Stroud but there is limited scope remaining in these directions, particularly if, as we would suggest, development is to be kept west of the motorway. In our view both the availability of suitable land and the structure of the existing town suggest that if there is to be significant further growth it should be along a north-south axis.

5.40. It would be feesible to extend Gloucester northwards roughly to Boddington, the physical limits being set mainly by the flood plein of the River Chelt. We have defined an area, Down Hatherley, which would be suitable for a large-scale urban expansion. Between this end Gloucester proper is a somewhat amorphous area within which a number of uses are at present contained by a green belt (see para. 6.19). These include:

i Staverton airport which could have only a limited role if further hemmed in by urban development. It is already developing on the lines of a small industrial and commercial estate. With a major population growth the site's strategic situation in the proposed road network would give it a potential as a major distribution centre;

ii the large RAF depot at Innsworth;

iii the industrial area on the A40 at Staverton;

iv the mainly recent and developing housing area stretching from Longlevens to Churchdown.

We believe it should be possible to achieve the integration of these at present somewhat uncoordinated developments into a larger urban pattern extending from Gloucester to a major new area at Down Hatherley. But the area immediately north of Gloucester which already contains the main road and rail connections between Gloucester and Cheltenham, will have to provide the routes for the links between Gloucester and any major northwards growth. Also a new through east-west route, of which the alraady proposed northern bypass to Gloucester will form a part, may well eventually have to be found through this area. In addition plans have been discussed for replacing Gloucester's two existing stations by a new one at Barnwood at the junction of the lines from Newport and Bristol. The complex problems of accommodating all these communication links in this area should be quickly resolved while the opportunity for a well thought out solution still exists.

5.41. To the south of Gloucester the area available east of the Sharpness Canal narrows as the line for the M5 motorway swings west round the foot of Haresfield Hill. If the optione for the large-scale development of areas west of the Severn (see 5.43 onwards) are to be kept open it would be prudent to curtail the southward spread at Quedgeley to allow for new north-south communication links which these would probably call for. These could well have to join the A38 and the M5, or any new Gloucester-Bristol link, just south of Hardwicke. We have refrained from suggesting the development of any of the areas between the Sharpness Canal and the Severn. These areas have a quality of remoteness which we feel can be preserved. In any case development would mean new bridges over the canal, which is embanked above the general ground level, and the areas for building would be curtailed by floodlands, gravel workings and by village conservation problems. At Quedgeley there are three substantiel, but not intensively developed, Ministry of Defence sites which employ some civilian labour. If they were ever re-developed for housing in conjunction with the present undeveloped land at Quedgeley the resulting increase of population could amount to about 30,000. However, we do not know what the long-term future of the Ministry of Defence sites may be nor have we been able to find any practical sources which could augment this area's road links from the A38 into Gloucester. For these two reasons we do not feel justified in suggesting, at present, thet it would be feesible to make significant changes in the pattern of population and employment for this area.

5.42. Altogether, therefore, our physical assessment suggests that once the mainly eastwards extensions of Gloucester already provided for in the development plan have been completed the most practicable direction for any further expansion would be northwards. The potential here is relatively large and, fully exploited, could increase the town's population from its present size of about 100,000 to over 170,000, but it would involva a modification of the green belt. It would also call for some restructuring of the centre of Gloucester but there is scope for achieving this.

The west bank of the Severn and the Leadon Valley

5.43. The rural west bank areas of the Severn, together with the valley of the River Leadon stretching north-westwards to around Ledbury, present a marked contrast to the urbanised east bank. From the A40 crossing of the Severn to the north-western limit of our area of search at Trumpet is a straight line distance of 16 miles; the width of the roughly triangular area of search here is some 12 miles at its base. There are 15,000 people living in this area with Newent (2,000) and Ledbury (4,000) the only towns within an established hierarchy of villages and farmsteads. Only a small amount of dormitory and suburban development has so far crapt in, mainly in the Highnam and Huntley areas.

5.44. Our survey suggested three major green field sites:

i a site, which we have labelled Huntley, in the Taynton, Tibberton, Churcham, Huntley area;

ii a sita centred on Staunton;

iii a site in the upper Leadon Valley to the north-west of the M50 motorway which we have labelled Dymock.

We defined the boundaries of these areas to avoid land liable to flood, various water-gathering grounds and the better landscape areas. Newent has been deliberately left as a separate small town and we have not incorporated Ledbury within the suggested Dymock area. Areas near the

River Severn were kept free from urban development. Thus we did not extend the Staunton area eastwards over the ridge which stretches north from Maisemore Park to Corse Wood Hill nor towards the attractive riverside area and village at Forthampton. Similarly, Highnam Wood marks the eastern limit of the Huntley area, which also has the result of leaving gravel reserves at Highnam free from surface development. Our suggestions for Staunton and Huntley avoid extensive areas of high class agricultural land which are located mainly in the general area of Newent. But the area at Dymock does embrace a tract of grade 2 agricultural land.

5.45. The disposition of these three selected sites also allows for the provision of any major communication links which their development might call for. Two potentially important long-term routes cross the areas of search:

i the A40 London-Oxford-Cheltenham-Gloucester-Ross-South Wales route;

ii the B4215 route linking East Severnside with the A49 route to Merseyside.

These routes combined could eventually traverse the gap between our suggested Staunton and Huntley areas which is already acting as an important corridor for transmission lines. A link with the M5/A38 route at Hardwicke (see para. 5.41) could be taken from Highnam which we have excluded from our suggested area. The eastern boundary of the Staunton area was drawn to allow for the duplication of the present M5 route by one located on the west bank of the Severn should this ever be called for. As far as links with Gloucester are concerned we are satisfied that suitable Severn crossing-points exist. With full-scale development and the provision of a new major east-west route the existing A40 might become the main local link between Gloucester and Huntley. These areas are not directly served by a main line railway station but the suggested new one at Barnwood would be reasonably accessible by road and would in fact be central to a major urban cluster which could comprise Cheltenham, Gloucester, Down Hatherley, Huntley and Staunton. With very large-scale growth there could be opportunities in the long-term for providing a major road-rail interchange at Churchdown, north of the Barnwood site, near to a possible line for our suggested new A40 road.

5.46. These three large sites total nearly 30,000 acres. They are substantially free from physical obstacles and if fully developed could accommodate over half a million people. We are satisfied that it would be feasible to provide for the drainage from such a massive development although it could present some special problems. Together they represent the largest new physical development potential we have uncovered anywhere in the Study Area. In our view all three, in terms of their topography, scenery, geology and climate, are very attractive sites indeed.

Other areas

5.47. Within our North Gloucestershire area of search the only other sizeable area we think physically suitable for urban development on any significant scale is around Coaley at the outlet of the Stroud valleys. Even here, however, we doubt if the area likely to be readily developable is large enough to warrant its identification for major new growth. We decided that we should regard this as a possible reserve for any long-term local expansion of the Stroud valleys; as such its future would be primarily for the local planning authority to determine.

Summary: North Gloucestershire

5.48. Altogether in North Gloucestershire there is the choice of four possible major sites for new development. One is relatively small, in our context, providing what would in effect be a further peripheral expansion of Gloucester and a modification of what is at present part of the local green belt. Three are large green field sites to the west and north-west of Gloucester. These are identified in Map 18 together with possible lines for any new roads that their development might require. The physical possibilities for change which we have identified are summarised in Table 5b. We estimate some 675,000 additional persons could be accommodated, the greater part in areas west of the River Severn.

Table 5b

North Gloucestershire: estimated capacities of selected developable areas

'000

Area*	Population 1986	Development plans, etc.	Other possibilities: Major new sites†	Other possibilities: Allowance for other areas	Total capacity for change (Cols. 3, 4 and 5)
(1)	(2)	(3)	(4)	(5)	(6)
North Gloucestershire	**452**	**81**	**536**	**58**	**675**
Severn Valley—East	253	57	46	40	143
Gloucester	100	18	—	10	74
Down Hatherley	—	—	46	—	
Cheltenham	88	13	—	—	13
Other areas	85	26	—	30	56
Severn Valley—West	15	1	490	1	492
Severn Valley—West	15	1	—	1	492
Staunton	—	—	180	—	
Huntley	—	—	120	—	
Dymock	—	—	190	—	
Outside Areas of Search	184	23	—	17	40
Cotswolds	68	4	—	2	6
Stroud Valleys	65	15	—	5	20
Forest of Dean	51	4	—	10	14

* For definition of areas (other than those in column 4) see Annex 5A.

† See Map 18.

Development plans

5.49. In 1966 this sub-area had a total population of just over 290,000. Over 200,000 of this was located in Newport, at the mouth of the Usk, and in Cwmbran and Pontypool in the Afon Llwyd Valley. This valley is the 'Eastern Valley' of the Welsh mining valleys; only its middle and lower sections are within the Study Area. The addition of the coastal areas stretching from Newport to the Cardiff suburbs in the west and to Caldicot and Chepstow in the east brings the population up to 80 per cent of the total for the sub-area. The rest is mainly rural with only four small towns—Abergavenny (10,000) and Usk (2,000) on the River Usk, and Ross-on-Wye (6,000) and Monmouth (6,000) on tha River Wye.

5.50. A mejor element in the planning of the area is the New Town of Cwmbran which was designated in 1949 as part of the general strategy of providing locations in the lower and wider parts of the mining valleys where new industries and houses could be built within journey-to-work distance of the old mining towns and villages. Cwmbran was located within the one fairly substantial readily developable section of the Afon Llwyd Valley lying between Pontypool and Newport. It was designed as a 'complete' town, the ultimate intention being to stabilise its populetion at a level of about 55,000. To this end it was originally planned to take population growth to about 45,000 during the 'development' stege. The population is now very near to that figure but it has been decided that the New Town Corporation should continue in existence so es, in effect, to extend the 'development' stage to the point where the 55,000 population level is reached. No decision has been taken covering growth beyond that.

5.51. Present plans for the Newport area includa one fairly large extension of the town southwestwards to Duffryn together with some minor accretions to places such as Rogerstone, Bettws and Malpas beyond the M4 motorway. We estimate that current plens and commitments for the whole of the Newport-Cwmbran-Pontypool aree could accommodete about 50,000 additional persons. A further 16,000 could be catered for by proposals mainly in the Caldicot and Chepstow areas. Within this erea thera has in the past few years been a number of small expensions to provide housing for some of the steel workers in the Llanwern works. None of this area is affected by green belt proposals; it is, however, current local policy to maintain breaks of relatively undaveloped land between Cwmbran and Newport and batween Cwmbran and Pontypool. Both Caerleon and Chepstow are being treated as conservation towns.

5.52. There are no proposals to disturb the existing mainly rural settlement pattern over the wide areas which make up the rest of this part of the Study Area. As far as we can judge the total population increase which might come about in these areas if all current proposals and commitments were taken up would be no more than 10-15,000.

5.53. We would, therefore, put the total physical planning provision so far made for population increase at about 80,000. A general picture of the pattern of development envisaged at 1981 is givan in Map 19, and summarised in terms of population distribution in columns 2 and 3 of Teble 5c on page 53.

The longer term

South Monmouthshire

5.54. In terms of longer-term davelopment potential this area of search can be considered as comprising the following sections:

i the Wentlooge and Caldicot Levels;
ii the area behind the Wentlooge Level and between Cardiff and Newport, including the Rhymney Valley;
iii the higher land behind the Caldicot Level lying between Newport and Chepstow and bounded on the north by the Wentwood;
iv the Afon Llwyd, Malpas Brook and Ebbw River valleys focusing on Newport and including Cwmbran New Town and Pontypool.

5.55. The Wentlooge Level extends for about 6 miles alongside the Severn between Cardiff and the docks area at Newport. Apart from one or two farmsteads and tiny hamlets it is virtually empty. It has a high water table and is below high tide level. It is formed of elluvial deposits with depths varying up to 70 feet with layers of peaty clay in parts giving generally very poor load bearing characteristics. In our view it is not a suitable environment for large-scale residential development. The area has been selected as a possible area for MIDA development which could extend to take in the Caldicot Level (see para. 4.85). We have some doubts whether the Wentlooge site is completely suitable for such an enterprise. Towards the eastern part of the site deep water would be available from a dredged channel from the Newport Deep to the Usk, but this part of the site would be immediately upwind of Newport. Large plants liable to produce problems of air pollution or noisa could not be accepted, which could seriously reduce the site's competitive position. The alternative of offering sites to light industries would not necesserily be available; the bad sub-soil conditions might well be acceptable only to larga capital-intensive plants which could absorb high foundation costs.

5.56. Tha Caldicot Level to the east of Newport presents the same problems of drainaga and foundation as Wantlooge but its industrial development would not be so seriously constrained by the existenca of large residential areas nearby. Wa would rata this as one of the best areas for major capital-intensive industries within our Study Area. Exclusive of land alraady earmarkad for extansions of tha Spancer Steelworks, the amount of land which we suggest could be made available would be of tha order of 6,000 acres. If the Usk channel ware dredgad this particular site could have the additional advantaga of being accessibla to bulk carriers of possibly up to 150,000 dwt. However, if opportunities for optimising the industrial potential of Caldicot are to be preserved

it will be necessary to protect the surrounding area from further residential development. This is reinforced by the possibility that reclaimed land on the Welsh Grounds, which flank the Caldicot Level, might eventually be considered as a site for an international airport. If it is desired to preserve such an option the growth of population within the area that would be affected by aircraft noise will have to be restrained.

5.57. Between Cardiff and Newport there is an area north-west of the Wentlooge marshes and south of the Caerphilly Mountains. It comprises the Rhymney Valley which is separated from the Wentlooge Level by a ridge aligned south-west/north-east. This ridge is relatively low at St Mellons but rises prominently to over 400 feet north-eastwards. Topographically this search area could be extended westwards beyond our Study Area boundary to take in areas that are already planned for Cardiff's future growth.

5.58. The western part of the ridge that backs the Wentlooge mershes is already agreed for an eastern surburban extension of Cardiff beyond St Mellons. East of this we have identified a further, but relatively small, area of developable land at Castleton: it is contained on its south and east by wet, low-lying areas and on the north-west by the trunk road A48 and the proposed line of the M4 motorway. The suitability of this site for residential use would, however, have to be questioned if large-scale industrial development and with it the possibility of air pollution, were ever to take place on the Wentlooge Level. North of the M4 line we have identified one further limited area around Michaelstone, including a tract of grade 1 agricultural land on the floor of the Rhymney Valley intensively farmed for market garden crops. At this point the Rhymney Rivar constitutes our Study Area boundary and we feel we should make it clear that it is not this fact alone which has led us to confina our Michaelstone site to an area east of the river. We think there could be landscape reasons against extending any development very far across the river. Also we refer elsewhere to the desirability of providing for the line of an additional east-west major road and we think ona possibility would be along the west bank of the River Rhymney.

5.59. Further east the area between the Wentwood and the Caldicot Level is traversed east-west by the main railway lines from London (via the Severn Tunnel) and from the Midlands, by the M4 motorway and by the A48. Much of it would undoubtedly be environmentally attractive but there are fectors that would have to be carefully weighed before accepting it as an appropriate area for large-scale development.

5.60. Thus although this area of search is actually just outside the Wye Valley Area of Outstanding Natural Beauty and tha statutorily defined Wentwood area of high landscape value it is nevertheless an extremely attractive area of countryside with low wooded hills and well farmed valleys. The most readily developable sites comprise extensive areas of grade 2 farmland. Also there are large limestone quarries whose importance would increase with major growth on Severnside. Furthermore the south-western parts of the area can already be affected by air pollution from the Llanwern steelworks. If the option of industrial development at Caldicot Level is to be kept open a belt of undeveloped country should be preserved around it. Here topography will help: we believe there would be no conflict if new residential development were confined broadly within the valley of the Nedern Brook near Caerwent where it might not be too badly affected by noise should it ever be decided to go ahead with the suggested international airport on the Welsh Grounds. However, this is a matter which can only be determined with knowledge of the siting and alignment of runways, the characteristics of the aircraft then in use, and the arrangements for stacking and flightpaths. There is the possibility that the area could be affected by any safeguarding requirements for a nuclear power station at Portskewett.

5.61. We have, nonetheless, identified a tentative area for development mainly in the area between Caerwent and Penhow. This, apart from the unknowns associated with the possible airport, would provide a very attractive site for a town of about 45,000 population which might be increased to 70,000 if it ever became feasible to extend urban development over the site of the former Royal Naval Propellant Factory at Caerwent. This is now in use as an ammunition dump which with its safeguarding area absorbs about 2,000 acres. However, we understand that its redevelopment would be expensive because the site is honeycombed with underground and semi-underground structures and the ground is contaminated with explosives. But in any case the site is of limited size and successful expansion here could lead to problems of land availability in the longer term, which could bring pressures on surrounding high landscape-value areas and on the conservation town of Chepstow. A town here would be between three and six miles of the present road crossing of the estuary and even closer to the most likely position for a second crossing. The development of such a location would induce a high volume of traffic at these criticel points in the regional communications system.

5.62. The other main possibility hera is in the Newport-Cwmbran-Pontypool area. This is roughly triangular with Newport as its base and flanked on the north-west by the impressive Mynydd Maen and by the broken, hilly country of Llandegfedd-Llanhennock on the north-east. It is already substantially urbanised with Cwmbran establishad more than twenty years ago within tha one remaining major developable area. The two main problems in the way of further large-scale expansion are topography and accessibility.

5.63. Newport is astride South Wales' main east-west lines of communication. It also lies across the north-south links between Cwmbran and the valleys to the north and the docks and industrial areas around Uskmouth and at Llanwern. The M4 motorway has five junctions at Newport and serves not only as a national route but as a local urban distributor. Its national role will be augmented when the new link to the M50, replacing the A449, is completed. The section between Malpas and Tredegar Park is already at design capacity as a 'rural' motorway. We are convinced it would be unwise to consider expansion in the Newport area without leaving open the opportunity for eventually duplicating the M4 since there is little or no scope for widening the existing road. Because of the terrain it will be difficult to find a new route, but we are reasonably satisfied that one such route is feasible to the north of the present

motorway, though it would involve tunnel and viaduct construction. An alternative would be to follow a route passing between the town and the docks. There appears to be only one possible bridging point here which would mean that the crossing would have to be designed to carry two roads—the motorway for through traffic and a road for local traffic.

5.64. There is only one sizeable new area which could be considered for development—south of Cwmbran end including land already being considered for the expansion of the New Town. Making an allowance for a corridor for the possible routing of a new M4 we estimate that this area might accommodate ebout 50,000 persons. A further 10,000 might be provided for if it were decided to fill in the very small undeveloped area between Cwmbran and Pontypool.

5.65. These additions to the alreedy plenned population of Cwmbran would call for eddltional north-south links to, and through, Newport. Because of topogrephy and recent peripheral growth these also will be difficult to provide, but we believe there are opportunities elong either bank of the river. Such en expansion would also, in our view, mean acceptence of the present M4 for use primarily as an urban distributor road.

5.66. Substantial redevelopment and expansion of Newport town centre is in progress but its location is eccentric to the urban area as a whole end its further expansion, which could most eesily teke plece yet further southwards, would accentuate this. Almost certainly population growth to the north of the M4 would have to be matched by a parallel provision of services. One possibility would be to design the area between Cwmbran and Newport as a 'complete' unit with its own central area facilities. We have not explored this aolution in detail but topographical conditions would seem to be favourable. In this way Newport would remain the central area for tha whole urban complex with separate lesser centres serving the new unit and Cwmbran. This solutlon would appear to be compatible with the existing and currently developing urban hierarchy.

5.67. The only other area which we would regard as suitable for building is the upper section of the catchment area of the little Candwr Brook near Llanfrechfa. In terms of area it might house about 17,000 persons; but it is east of the main north-south route A4042 which is the one main road serving Cwmbran and Pontypool and linking Newport and the M4 with Abergavenny and the Heads of the Valleys road. We hava been unable to find a solution to the problem of providing this area with access and we doubt whether it is feasible to develop it satisfactorily.

North Monmouthshire

5.68. Our area of search in North Monmouthshire is roughly triangular between Abergavenny, Monmouth and Usk. It is ringed by beautiful country, much of it mountains, with the Brecon Beacons National Park to the north-west and the Wye Valley Area of Outstanding Natural Beauty to the aast. It is a completely rural area and a high proportion of the area of search itself would undoubtedly be formally identifiad as of high landscape value were it located in a less well endowed part of the country.

5.69. Within this area of search we heve identified two areas where large-scale development might be physically feasible. One, centred on the small town of Raglen at the junction of the A40-A449, drains to the Olway Brook (an east bank tributary of the Usk) and could accommodate ebout 105,000 persons. The other, immediately adjoining to the north and centred on Llanarth, drains westwards and southwards to the Usk and could accommodate about 120,000 persons. All, or part, of either area could be developed separately but for Study purposes we have treeted the possibilities in terms of one overall major development covering a population of 225,000 and we have applied the name 'Raglan' to the whole of this.

5.70. The area west of the River Usk is traversed by the north-south road and rail routes between Abergavenny and Newport. We have alreedy implied that continuing growth in the Pontypool-Cwmbran-Newport area will make it necessary to augment the A4042 route neer end within Newport. The existing road, even with improvements, will be heavily loaded in the Cwmbran area—which was a reason for our doubting the feasibility of an eastward expansion of Cwmbran ecross it towards Llanfrechfa. We investigated the poesibilities for a completely new north-south route through the hill country eround Llandegfedd and we think it would be practicable to build what would be a spectacular new road on a line east of the reservoir. But its construction would be very expensive and, in consequence, we have been reluctant to suggest major new development along the present A4042 route north of Pontypool. This area is in any case well wooded, scenically attractive country on the adge of a National Park and there must be doubts about the propriety of introducing large-scale urbanisation here. The extreme southern portion of this area has already attracted the Royal Ordnance Factory at Glascoed, I.C.I. Fibres (research and development) and the Parke Davis pharmaceutical establishment at Mamhilad near Pontypool. We have coma to the conclusion that we should not include this area west of the Usk, and centring roughly on Goetre, as a poesible area for major development.

5.71. The north-east part of the area of search is drained to tha Wye by the River Trothy. North of this river the topography becomes progressively mora broken and because of this and detailed landscape and drainage considerations we would not favour opening up this area for large-scale development. We would, however, record that it might be possible to accommodate about 50,000 persons in the Trothy Valley around Llantilio Crossenny but we think that this should not be considered unless a major town is built at Raglan and until it became necessary, in the very long term, to seek areas for its expansion.

5.72. We would emphasise that although large-scale davelopment at Raglan is physically feasible our selection process only marginally identified the erea as a possibility. Because of extensive flooding from the Olway Brook and the Usk and the use of the Usk as an important source of water supplies there will be drainage problems. The solution to be adopted will depend on the scale and pace of devalopmant. Treated sewage effluent would have to be taken to the Usk below the Rhadyr intake for the Llendegfedd reservoir and

possibly to below the Llanwern steelworks intake at Llantrisant. With major growth, effluent might even have to be pumped to the estuary itself—either to near Goldcliff with a four mile pipe out to the Newport Deep or over the eastern end of Wentwood to discharge into deep water just below the Severn Bridge. These solutions would be very expensive. Also a high proportion of the developable area is grade 2 farmland, and much of the area comes very near to being regarded as of high landscape value. Large-scale development here would involve an intrusion into a part of what is an exceptionally extensive and prosperous rural area with a well established settlement hierarchy. In the long-term there could also be problems with the area's road system (see para. 4.30).

5.73. This would be a delightful location in the midst of superb country with an excellent climate in the rain shadow of the mountain mass of South Wales. But apart from the physical availability of the site we see little reason for carrying out such a development. A major new town here would play no obvious part in a South Wales urban strategy; nor do we see any wider national grounds for promoting growth at this particular point.

The Wye Basin

5.74. The possibilities for large-scale development in this part of our Study Area are topographically limited. Effectively, the one major area for consideration is at Ross-on-Wye in an area bounded in the south by the line of the A40, in the west by the floodplain of the Wye and on the north and east by the well-defined ridge which marks the watershed between the Wye and the Severn river system. As with the Raglan area, we see no positive reason for promoting development here and in any case we think there are overriding reasons against doing so:

i the Wye is one of this country's largest virtually completely clean rivers. It traverses some of the scenically most important parts of the country. It provides excellent fishing and has a potential as a major source of water supplies. There would have to be strong reasons for seeking to use it as a drainage outlet for major new urban and industrial uses;

ii Ross-on-Wye is a conservation town with important tourist appeal. Its essential character and that of its setting could be destroyed by major growth;

iii the area suitable for building is attractive rural landscape and mainly grade 2 agricultural land.

Summary: Monmouthshire-Ross

5.75. The choice of sites in the Monmouthshire-Ross sub-area is severely restricted by topographical and scenic considerations. Indeed we suspect there may well be better physical planning opportunities outside our Study Area in the Vale of Glamorgan. In our view the only obvious possibilities in the Area lay in closing, or substantially reducing, the gaps that still remain between Cwmbran and Newport and between Cwmbran and Pontypool and one solution which we think worth further investigation would be the building of a 'complete' district of about 50,000 population integrated within a larger urban complex comprising Newport, Cwmbran and Pontypool. Parallel with this type of development we think there is a major industrial potential on the Caldicot Level. These developments would necessitate eventually a major increase in the capacities of the vital east-west roade that pass through Newport. Such new

Table 5c

Monmouthshire-Ross: estimated capacities of selected developable areas

'000

Area*	Population 1966	Development plans, etc.	Other possibilities: Major new sites†	Other possibilities: Allowance for other areas	Total capacity for change (Cols. 3, 4 and 5)
(1)	(2)	(3)	(4)	(5)	(6)
Monmouthshire-Ross	**291**	**80**	**399**	**21**	**500**
South Monmouthshire Plain	233	67	174	4	245
Newport area	123	28	—	—	28
Cwmbran area	40	20	—	—	
Cwmbran-Newport	—	—	51	—	81
Cwmbran-Pontypool	—	—	10	—	
Pontypool	37	1	—	—	1
St Mellons	6	2	—	—	
Michaelstone	—	—	28	—	45
Castleton	—	—	15	—	
Caldicot-Chepstow	27	16	—	4	
Caerwent	—	—	70	—	90
North-East Monmouthshire	12	3	225	4	232
North-East Monmouthshire	12	3	—	4	
Raglan	—	—	105	—	232
Llanarth	—	—	120	—	
Ross area	16	2	—	3	5
Outside Areas of Search	28	8	—	10	18
Abergavenny	17	5	—	6	11
Usk	7	2	—	3	5
Wye	4	1	—	1	2

* For definition of areas (other than those in column 4) see Annex 5A.
† See Map 20.

and improved roads are also likely to be important if tha areas identified at Michaelstone and Castleton are developed. With the existing and already proposed development at St Mellons to the west and at Duffryn to the east this would virtually become a Cardiff-Newport linear urban area. Thus, if entirely taken up, the possibilities we hava selected would lead to an intensification of the urban belt which is already developing in South Wales from Swansea, through Port Talbot, Bridgand, Llantrisant, and Cardiff to Newport-Cwmbran-Pontypool.

5.76. In addition there is the very aubstantial site at Raglan and a smaller site at Caerwent. In Map 20 all the possible sites we have discussed are shown and they are listed in Table 5c. We have assessed the total capacity for change at about 500,000 persons but almost half of this is accounted for by the inclusion of Raglan and Llanarth.

Summary: total capacity for change within the Study Area

5.77. In Table 5d the information givan in the sub-area Tables 5a-5c is consolidated to present a summary of the land development possibilities for the Study Area as a whole; these ara indicated in Map 21. This assessment of the Area's capacity to absorb additional population is based mainly on the physical characteristics of areas which, on our stated criteria, we consider developable on a large scale. While these criteria are bound to reflect our view of requirements over the general time-scale covered by our Study the findings are certainly not a forecast of the demands for land which will arise over any specified period. The estimated capacities of tha major new sites are merely an indication of availability. To this has been added the current land-use planning provisions plus our allowance for what might be a similar reasonable long-term provision for places outside our main areas of search. The resultant total of 1,750,000 is a compound of physical capacity, current plans, and forecasts. It indicates broadly the maximum additional population which the Area could ultimately accommodate if development is not to be pushed into areas which, on our current thinking, we would not want to see built over. The total resulting population of about 3½ million is broadly in line with the level of population which we intuitively feel is the maximum beyond which there could be intolerable strains on the surrounding areas of recreation and natural beauty and with the level which the Nature Conservancy feel would not have a disastrous effect on wildlife (para. 4.66).

5.78. This analysis has produced a range of what we regard as attractive physical planning options. The question of how far an attempt should be made to exploit them either over the Area as a whole or in any part of it needs now to be considered. This involves examination of certain general planning issues (Chapter 6) and an assessment of the economic and industrial potential of the various areas (Chapters 7 to 9).

Table 5d

Study Area: estimated physical capacity for additional population

'000

Item	Study Area	Bristol-Bath	North Gloucester-shire	Monmouth-ahire-Ross
All possibilities	**1,750**	**575**	**675**	**500**
Davalopment plans, etc.	260	99	81	80
Suggested major new sitas	1,343	408	536	399
Allowanca for othar araas	147	68	58	21

Annex 5A

Definitions of areas used in the tables

Table	Area	Constituent areas
5a	*Bristol-Bath*	Statistical zones*: 1-12, 14-19, 22-43
	Bristol	,, ,, 6, 7, 14, 15, 30-43
	Frampton Cotterell-Yate	,, ,, 3, 8, 9, 11
	Vale of Berkeley	,, ,, 1, 2, 4, 5
	Cotswold Fringe	,, ,, 10, 12
	Weston	,, ,, 25-27
	Bath Area	,, ,, 16-19
	Rest of N. Somerset	,, ,, 22-24, 28-29
5b	*N. Gloucestershire*	Statistical zones: 50-87
	Gloucester	,, ,, 62, 63, 65-67
	Cheltenham	,, ,, 75, 76, 79-82
	Other East Bank	,, ,, 52-54, 59, 61, 64, 68, 74, 77, 78, 87
	West Bank	,, ,, 50, 51, 60
	Cotswolds	,, ,, 55-58, 73
	Stroud Valleys	,, ,, 69-72
	Forest	,, ,, 83-86
5c	*Monmouthshire-Ross*	Statistical zones: 118-132, part 108
	Newport	,, ,, 118, 126-131
	Cwmbran	,, ,, 118
	Pontypool	,, ,, 117
	St Mellons	,, ,, Part 108
	Caldicot-Chepstow	,, ,, 122, 124, 125
	North-East Monmouthshire	,, ,, 121
	Ross Area	,, ,, 132
	Abergavenny	,, ,, 119
	Usk	,, ,, 120
	Wye	,, ,, 123

*See Map 1.

6 THE PHYSICAL PLANNING ALTERNATIVES

Introduction

6.1. In the previous chapter we concluded that land could be found to accommodate, if necessary, a population increase of up to 1·75 million (from 1966) distributed, as it so happens, about equally between the three main sub-areas into which the Study Area falls. This would, however, involve doubling the Area's population and there can be no doubt that this is impracticable by the year 2001. Rates of development can vary widely over such a time-scale and there is no fundamental reason why growth should be uniformly distributed between different parts of the Area. Altogether, therefore, within the framework of our physical planning findings, a considerable number of alternative hypothetical plans for the next 20 to 30 years and programmes for their implementation could in theory be formulated and compared in detail.

6.2. This would not be a manageable approach. In any case no precisely conceived plan and programme for the Area could possibly remain valid over our time-scale. We have, therefore, confined ourselves to an attampt to systematize the physical planning possibilities into a limited number of possible strategies within any one of which detailed plans and programmes could eventually be framed as and when actual development needs arise.

6.3. We believe that as far as the physical planning options are concerned the many possibilities can ba reduced to the following three broad alternative strategies for each of the sub-areas:

i strict adherence to the concepts of the present development plans;

ii adherence to present development plan concepts for all existing urban areas, but with the introduction of some large new towns in rural areas well away from existing large towns and their green belts;

iii major expansions of, and near to, the main existing urban areas of Bristol, Gloucester and Newport to create three major urban sub-regions.

Although certain arguments for each of these alternatives apply equally in all sub-areas it does not necessarily follow that the same alternative has to be chosen for all three. There might, for example, be major expansions in one or more of the major urban areas and maintenance of existing planning concepts elsewhere.

Adherence to development plan concepts

6.4. Throughout the Study Area present development plan policies operate against the unrestrained growth of the very large towns. Bristol, Bath, Gloucester and Cheltenham are all wholly, or in part, contained by statutorily defined green balts with limited plans for growth beyond these belts. In Monmouthshire there is a declared aim to prevent the coalescence of Newport, Cwmbran and Pontypool, and to maintain the present wide gap between Newport and Cardiff.

6.5. Accommodation must, however, be found for (at the vary least) tha natural growth of the one million people contained in the Study Area's main towns. In the Bristol area there are established policies for diverting demand to relatively small expanded urban areas beyond the grean belt at Yate, Nailsea and Thornbury. There is scope for a further development of these policies, particularly if drainage problems in the Yate area can be solved. The possibilities are on a smaller scale at Nailsea, the site of which is restricted by surrounding low-lying land, and at Thornbury where there ara conservation and amenity objections. There is also general encouragemant for development at medium-sized towns: an expansion of the Stroud Valley towns on to the flatter areas around Coaley and a growth of Weston-super-Mare beyond the presently agreed limits would not seem to be incompatible with this policy.

6.6. Elsewhere current policies for dealing with growth tend to favour the selective development of the existing pattern of small towns and urban villages. Here the scope is limited. Large areas of the Cotswolds, Forest of Dean and the Mendips are in Areas of Outstanding Natural Beauty where there is a strong presumption against substantial growth. Also, four of the small towns—Tewkesbury, Chepstow, Monmouth end Ross-on-Wye—are conservation towns and several of the larger villages may also be regarded as in the same category. This leaves only three groups of aignificantly sizeable settlements for consideration. These comprise about a dozen small towns in the Forest of Dean based on tha old mining villages; a group (also with origins in coal mining) in the Norton Radstock area, and a few settlements in the area between Weston-super-Mare end Nailsea. An evolution of current policies could well permit some consolidation and expansion of the Forest of Dean and Norton Radstock communities. But in both these areas there are topographical difficulties in the way of really large-scale development and Norton Radstock is very near Bath. The developments in the area north-east of Weston-super-Mare are mainly in small restricted islands which rise only slightly from the surrounding low-lying areas and offer little scope for expansion. The villages round the eastern rim of this area are contained by areas identified as of high landscape value. In Monmouthshire outside the Newport-Cwmbran-Pontypool area there are very wide areas of thinly populated countryside and very little in the way of an embryonic urban settlement pattern upon which to fasten.

6.7. As regards the purely rural areas, where population is confined to small villages, hamlets and isolated dwellings, the policy throughout the Study Area follows tha generally accepted practice of discouraging a sporadic and widely dispersed spread of development.

6.8. In the previous chapter we assessed the provision for population growth currantly made by the local planning authorities at a total of 260,000. We have formed the opinion that nowhere do these policies lend themselves to substantial further growth and that on these planning concepts the Area would not be capabla of absorbing a total population increase of more than about half a million (from 1966). A continuation of past trend rates of population growth would produce an increase of this order in the early 1990s so that after that time any further growth would raise serious overspill problems. Moreover scattered growth in many small units would place strain on the provision of services, would make for long journeys-to-work, and for shopping and entertainment and would intensify the danger of irreparable damage to the many attractive and historically important towns and villages in the Area. Although these policies could be followed in parts of Severnside, we believe that in the long-term they will in general prove unsatisfactory whatever the Area's rate of growth. In any case, we must rule out this alternative for our purposes since it would not provide any prospect of accommodating substantial immigration from the rest of the country.

A dispersed new towns strategy

6.9. The sparsely populated agricultural areas broadly along the M50/A40 axis and the areas at the foot of the Wentwood on the A48 axis are the only parts of the Study Area where very large free-standing urban developments could be introduced without directly interfering with countryside that has been statutorily defined as of special landscape significance. The smaller possibility at Berkeley on the M5 axis is currently ruled out by the safety precautions for the nuclear power station.

6.10. The main possibilities are a new city in the Raglan area where a population of eround 225,000 could ultimately be accommodated, a naw town with a population of 190,000 at Dymock, and a new town of up to 70,000 population at Caerwent. If these are added to the possibilities under current policies the total additional population which could be provided for in the Study Area would be increased to somawhere around 900,000. This development strategy would be a raletively simple one in physical planning design terms and one which would undoubtedly produce excaedingly attractive residential environments.

6.11. Raglan would be at the point where the A449 route from Newport and tha Heads of the Valleys road join the A40/M50 route. A new town at Dymock would ba well placed in the developing national motorway system and, also, on or near a possible new A40 route and a possible improved Severnside-Merseyside route; it would be on a rail link between South Wales and the Midlands. Caerwent would have easy access to the M4. As Raglan and Dymock are some 15 miles from existing major urban centres this solution would not complicate the internal transportation problems already facing these parts of the Area. Development at Caerwent would however be liable to induce a large increase in local traffic growth over the Severn Bridge while a major expansion at Raglan would eventually bring problems of capacity on the A40 route. Development at Raglan might also create difficult drainage problems.

6.12. All these schemes involve major urban intrusion into unspoilt areas with high landscape and agricultural value. We are very doubtful whether the national need for new living space would warrant such a sacrifice. Moreover, while this strategy would cause the minimum disturbance to the existing urben pattern, a major effort would be called for to switch growth from the established end prosperous towns towards brand new areas where an urban infrastructure and massive employment opportunities would have to ba built up from scratch. The initial costs would be high, though the eventual benefits might be correspondingly good.

6.13. Finally, there is the question of leaving room to manoeuvre in the longer term. On the strategy we are discussing an early start on major new towns would be accompanied by a rigorous restraint of the spread of urban development around the existing main urban centres. This would tend to make any subsequent attempt to restart their growth somewhat expensive because once a traditionally designed town has been redeveloped within a green belt it progressively acquires a structure of roads and buildings and of planning expectations that would make subsequent major change very difficult. Thus, while a decision to expand Bristol, for example, would still leave open the option eventually to build a new city at Raglan the converse would not necessarily apply.

The development of urban sub-regions

6.14. The majority of the areas we have selected as physically suitable for large-scale development are, as it so happens, around the existing large urban areas. Concentration of building in these areas would have the advantage of producing three major 'urban sub-regions'—Bristol, North Gloucestershire and Newport-Cwmbran-Pontypool.

6.15. We do not need to set out in detail the theoretical arguments which have frequently been advanced in favour of substantial urban concentrations—the advantages of access to larger and more varied shopping and cultural activities, the economies of scale in the provision of infrastructure, the advantages to industrialists and workers of a larger labour market with varied employment opportunities etc. These do not always over-ride the disadvantages of expansion in particular cases, but in the circumstances of the Study Area, as the following analysis will show, there are important possibilities in each of these sub-areas.

Bristol

6.16. We have concluded that the only way in which a really major population increase could be catered for in the Bristol area would be by developing the area identified as 'Frampton Cotterell' in paras. 5.15-5.25. This expansion of Bristol which could not be carried through without the realignment of the green belt system north of Bristol, would be a very complicated operation but it would produce a well located urban concentration. With this solution most of the population would be city dwellers; but nearby would be wide areas of fine country in and near the Cotwolds and in Berkeley Vale which would, on the basis of our proposals, be preserved from development. A new outlet here would forestall any increase of pressures on important sectors of the existing green belt south of Bristol and between Bristol and Bath.

6.17. The total numbers that could be provided for with this strategy in the whole of the Bristol-Bath sub-area could amount to around 500,000. Further development by expansion of the Wapley area would not be excluded; nor would a new town at Berkeley if relaxation of the restrictions around the nuclear power station ever made this possible.

6.18. On our physical planning assessment the options in the Bristol area are clear cut. The area either builds on present policies, which will lead to a modest and mainly dispersed growth, or Bristol must expand to become eventually a very large city of 800,000 or 900,000 population. If it is to be the latter then an early start on detailed design studies would be necessary because of the risk that opportunities for growth could be prejudiced if steps are not taken to protect the lines of the new roads which will be called for. Also, there is a need for early guidance on the drainage problems that have already arisen in the Frome Valley. It would in any case take time to mount such an expansion; the design problems are complex. For example, it is essential that the preferred detailed solutions should be evaluated by means of transportation studies before plans are implemented. In Map 16 we give some indication of the settlement and communications patterns that might emerge, but these are purely schematic to test the feasibility of the basic concept.

North Gloucestershire

6.19. We have shown in paras. 5.34 to 5.48 that there are possibilities of expansion near Gloucester on both the east and west banks of the Severn. We believe that for a major expansion in this part of the Area physical planning considerations—drainage, traffic, conservation and the green belt—would tend to favour opening up new areas on the west bank of the Severn rather than producing a continuous urbanised development on the east bank. The result would be a very large cluster development which could be attractively set within a new green belt system incorporating such important features as the River Severn and its small tributary the Leadon. This form of development would offer flexibility in programming. It could also avoid the drastic redevelopment and restructuring of Gloucester and Cheltenham that might otherwise have to be faced if these existing towns were to grow rapidly by peripheral expansions. At the same time the populatione and businesses of the new units in the cluster would enjoy from the outset the extra higher order services that are already available not too far away in the established towns in the cluster. While each urban unit would be of manageable size, but nevertheless large enough to be 'complete' in most respects, the total population in the whole cluster could be large enough to support some highly specialised services and could afford a wide range of employment opportunities to those

prepared to travel, or move house locally. Superficially, therefore, cluster development might seem to combine the usually accepted advantages of both the medium-sized town and of the larger urban area even though it is not likely to acquire the identity of a city focused largely on a single centre.

6.20. The question of whether a cluster in North Gloucestershire could be a viable urban concept could depend in part on the communication links that could be provided between the component parts. Map 18 illustrates some possibilities. It shows the disposition of possible units in a cluster development, the general location of some possible internal links, and the relationship of such a form of development to a possible national and regional road network.

6.21. An early decision to be taken with such a strategy would be that development was going to take place on the west bank and secondly, the timing of the start of that development. One possibility would be to make a start on the west bank once all the currently agreed proposals for Gloucester and Cheltenham had been taken up. This would leeve our suggested area at Down Hetherley, north of Gloucester, either undeveloped as part of the existing green belt or to be developed gradually as a continuing outlet for demand that is tied to the east bank. Alternatively, it would be possible to complete the building of all the areas available at Cheltenham and at Gloucester, including Down Hatherley, and then to move to the west bank. In any case we assume that development would take place successively in each of the three suggested west bank sites, Staunton, Huntley and, ultimately, Dymock.

6.22. We estimate that with our suggested areas for new development this strategy would enable a population increase of upwards of 450,000 to be accommodated eventually in North Gloucestershire even leaving the Dymock area out of account. We believe this solution merits detailed evaluation.

Newport-Cwmbran-Pontypool

6.23. Within a strategy of creating major urban sub-regions the main proposal for the Monmouthshire-Ross sub-area would, on our analysis, be the building of a 'complete' new district of some 50,000 population between Newport and Cwmbran. The effect of this would be to create an urban area between Newport end Pontypool which would eventually have a population of about 300,000. By so concentrating on Newport-Cwmbran-Pontypool the total additional population which might be provided for in this sub-area could be around 150,000.

6.24. The concept of building up urban sub-regions could, however, be applied more widely to the linking by development of the Cardiff and Newport areas, although the additional numbers which, in our view, could reasonably be accommodated would only be about 45,000. Such a possibility raises problems outside the Study Area which could be examined in the light of the detailed studies carried out for Cardiff and Llantrisant by Colin Buchanan and Partners.[14] As far as catering for a very large expansion was concerned, the Cardiff studies opted for development at Llantrisant rather then in areas east of Cardiff. We would not quarrel with this; indeed from our own superficial look at the areas beyond our Study boundaries it has seemed to us that the Llantrisant site has many of the physical characteristics we have been looking for in our own searches for major areas for development. But we are not concerned to decide whether the areas east of Cardiff are an alternative to Llantrisant. The question for us is whether building there is physically feasible and, if so, would it satisfactorily supplement development in other parts of our Study Area and in areas adjoining. In this we are satisfied that the areas we have identified can be built on without special difficulty. Also, if our suggestion that it may be necessary in any case to duplicate the proposed M4 route is proved well founded it could, in the result, become possible to find solutions for the transport problems involved. In fact there is at present relatively little journey-to-work movement between Cardiff and Newport although this may well grow. Moreover, the case for urban development between them could be very much affected by any arrival of large employment generators on the Wentlooge Level. We have expressed doubts about whether physical circumstances favour this, but the possibility cannot altogether be ruled out, and on Map 20 we have included suggestions for development and communication links between Cardiff and Newport in order to leave on the record some indication of what development there might involve.

6.25. For the present, however, we conclude that as far as Monmouthshire-Ross is concerned a Severnside strategy based on the evolution of urban sub-regions would mean mainly expansion along the Newport-Cwmbran-Pontypool axis, leaving the possibility of developing areas east of Cardiff as a long-term option which would be contingent upon transport and industrial location development.

Summary: all urban sub-regions

6.26. A general urban sub-region strategy for the Area would undoubtedly cater for large increases of population. The physical planning possibilities would be of the order set out in Table 6a. Even with this scale of expansion it would still be possible subsequently to extend a North

Table 6a

Study Area: estimated capacities within an 'urban sub-region' strategy

'000

Area	Population 1966	Suggested capacity for change
Study Area	**1,635**	**1,160**
Selected urban sub-regions	987	858
Other areas	648	302
Bristol-Bath	892	513
Urban sub-region*	584	359
Other areas	308	154
North Gloucestershire	452	485
Urban sub-region†	203	389
Other areas	249	96
Monmouthshire-Ross	291	162
Urban sub-region‡	200	110
Other areas	91	52

* Bristol, Frampton Cotterell

† Gloucester, Cheltenham, Staunton, Huntley.

‡ Newport-Cwmbran-Pontypool

(14) See footnotes (11) and (12) in Chapter 4

Gloucestershire cluster into the Dymock area; an enlarged Bristol could be further extended into the Wapley area; and in Monmouthshire it might be possible to develop between Newport and Cardiff. Also, although each urban sub-region could become very large they would remain far enough apart that they would not induce a level of 'inter sub-regional' traffic which could rapidly overwhelm the capacities of the national route systems which serve them. This is an especially important consideration with the Severn estuary crossing between Bristol and Newport.

6.27. Concentration of major population growth within selected areas in this way also has the advantage of conserving from development very wide areas of fine country and would be most acceptable from the points of view of protecting wildlife and safeguarding agricultural production. Finally, there is nothing in this strategy which would prevent the building in the very long-term of new towns at Raglan, Caerwent and Dymock. Thus, this approach would seem to offer flexibility in the staging of the Area's physical planning.

The estuary

6.28. With an urban sub-region strategy for the Study Area although what happens in one sub-area will have some effects elsewhere in the Area, the consequences are not likely to be sufficiently great for the developments in one sub-area to affect in a major way what is done in another. This is because the main urban centres are a substantial distance apart and because of the divisive effects of the Severn estuary. The estuary's role in the development of the Area would, however, change radically if a MIDA, an International airport on the Welsh Grounds or any of the several proposals for constructing a barrage were ever implemented. These developments are, however, all very large-scale and would take many years to design and bring to fruition. We decided, therefore, not to base any of our proposals for major development on an assumption of the early realisation of any of them, although we have been careful to point out instances where development would react with any of these projects.

6.29. It seems probable that with or without a MIDA there could be some additional industrial development on the Caldicot Level over our time-scale. This could well be capital-intensive and the net demand for labour might not be large. It is possible that the overall situation would not be radically different even if a full scale MIDA were established. The timing and nature of the industries which such a venture could attract would be largely unpredictable; nor is it certain that they would promote locally much in the way of ancillary industries. On the other hand, depending on the types of industry attracted, the demand for labour could equally well turn out to be substantial. In the latter circumstances we think it could become necessary to build a new town at the site we have identified at Caerwent. The fact that the existence of this site could help to keep open the option of making large-scale exploitation of the Caldicot Level a feasible proposition is, in our view, one reason why Caerwent should not be selected for early development.

6.30. The impact of an international airport and of a major barrage could be much more radical. Thus an airport, together with a successful MIDA, might call for perhaps 30-50,000 workers and a population increase of, say, 200,000 or more. A barrage, and with it improved port facilities, increased recreational outlets and new cross-estuary links could be expected not only to generate some increase in the Area's pace of general growth, but a reorientation in the direction and pattern of growth if the new crossings were well down the estuary. In such circumstances it is possible that the Raglan area would become economically more attractive. But in any event there would have to be a reappraisal of the Area's potential and a further look taken at the possibilities in areas which we have not felt able to identify for large-scale development on the criteria adopted for the present Study. We would not in any case expect our Study to be treated as a once and for all exercise. However, in so far as we have felt able to speculate on what these major schemes could mean for the Study Area it is unlikely that opportunities to carry them out will be prejudiced by any developments associated with our suggested strategies.

Towards a preferred solution

6.31. We cannot claim to have carried out a fully quantified assessment of the relative costs and benefits of the three broad strategies for the Area set out in para. 6.3. Nevertheless the choice from a physical planning point of view seems to us clear. We consider that opportunities for major development in this Area could best be realised by carrying out large expansions closely related to the existing city and urban areas of Bristol, Gloucester and Cheltenham, and Newport-Cwmbran-Pontypool. As we shall show later, economic considerations point the same way.

6.32. This would inevitably mean that an increasing percentage of the Area's total population would be town and city dwellers. In this connexion we would emphasise that the large-scale expansions we are envisaging would have to be associated with local prosperity. We would expect the developments to be of high quality and well provided with amenities. Anything less would

represent a failure to take full advantage of the splendid sites available.

6.33. On the other side of the coin this strategy would enable wide areas of attractive countryside and of high-grade agricultural land to be kept free of the direct threat of urban development. The mere fact that the long-term supply of first class urban building land could be seen to be assured would ensure that the spread of out-of-scale suburban type developments into the rural areas could be firmly resisted.

6.34. There will always be the danger that over-urbanisation will sooner or later threaten the Study Area's considerable environmental attractions and that costs will rise as development extends to more difficult sites. In our judgement this should not seriously arise so long as development is kept within the spatial limits we have identified. By concentrating expansion around existing urban areas and by not developing, in this century, the major areas we identified at Raglan and Dymock, the danger of over-urbanisation would be that much less.

6.35. If this 'urban sub-region' strategy is generally adopted to cater for major growth on Severnside, the Study Area's total capacity for change (see Table 6a) would, we estimate, amount to roughly 1·2 million persons to give a total population of the order of 2·8 million. In rounded numbers the additional capacity would be distributed between the sub-areas as follows:

Bristol-Bath	500,000 persons
North Gloucestershire	500,000 persons
Monmouthshire-Ross	160,000 persons

6.36. Within these broad totals there are many detailed options. Growth need not proceed at identical percentage growth rates in each sub-area and within each sub-area the treatment of particular sites can be widely varied. A major consideration in the remaining chapters of the report is to elucidate the economic factors which would influence the selection of various growth rates.

7 THE PRESENT ECONOMY OF SEVERNSIDE

Introduction

7.1. Previous chapters have examined the physical feasibility for large-scale growth mainly in terms of the availability of land taking into account the constraints imposed by the existing settlement patterns and by areas of land of high agricultural quality or outstanding natural beauty. This chapter and the following ones describe the economy of the Study Area and its prospects, and consider the implications of these for the scale and rate of development in the areas of physical opportunity.

7.2. In analysing the economy of the Area we drew not only on a wide range of data available in Government departments and from local authorities, but also on the results of the Unit's Industrial Survey of local manufacturing industry which provided us with valuable information about various industries, including estimates of future labour needs. This material helped provide the basis for our studies of the prospects of the Area both in the years immediately ahead, and, more impressionistically, in the longer term.

The general picture

7.3. Total population and employment in the Area have grown rapidly since 1952 at rates which are well in excess of national growth and those of many other regions. The Area has not shown any signs of structural decline and unemployment was well below that in many other parts of Great Britain. The growth of employment opportunities led to and was fed by the high rate of inward migration which accounted for the fast growth of the total population.

7.4. Each of the main urban areas is to some extent dependent on one type of activity. In Bristol-Bath manufacturing employment is strongly weighted by the aircraft industry which will be greatly affected by the progress of the Anglo-French Concorde project. The future of the aircraft industry is not easily predictable and the longer term will be much affected by any national rationalisation proposals which might be required by technological changes which are themselves impossible to forecast. A decline in the local aircraft industry should not however do more than put back growth in the area for a time. Among many other industries in the area, engineering (especially the mechanical side); food, drink and tobacco; and paper, printing and publishing also have particular importance. Services employ more than any other sector of the sub-area's economy, mainly because of Bristol's size and regional capital role. Although Bristol provides certain national services such as a university and the offices of several national insurance companies, the degree of growth and stability will necessarily be closely related to developments in the sub-area. The port of Bristol is much more important as an importer of raw material than as an importer of finished products and the docks are not an important direct source of employment. The Bristol-Bath sub-area has been a net exporter of manufacturing industry to other parts of the country while still growing in total employment which indicates a degree of industrial energy and a desire for growth.

7.5. In the North Gloucestershire sub-area the remarkable growth in manufacturing employment has been largely due to the 14,000 new jobs which have arisen since the early 1950s in mechanical engineering: it now provides 20 per cent of all male employment in that sub-area. Much of the growth can be associated directly with firms moving branches into the area and occupying premises left empty as a result of the Gloster Aircraft Company closure. The aircraft industry is still however of some importance to the area as is the old-established textile industry. The impact of the inward movement of certain major branches of major firms to the area on its longer-term economic viability is difficult to assess, as sometimes when firms contract or reorganise there is a tendency to move work back to parent plants elsewhere in the country.

7.6. Employment in Monmouthshire-Ross is dominated by steel—the biggest steel plant being the one at Llanwern which directly employs

8,500 people, mostly men, or 7 per cent of all the jobs in Monmouthshire-Ross, and as a high earning industry produces a considerable multiplier effect on local services. Employment growth which has been below the national average must be seen in relation to adjoining Industrial South Wales, for the net effect of large-scale creation of employment can be measured only by comparison with the scales of employment decline in coal-mining on the other side of the area boundary: some 20,900 workers commute daily into the sub-area while 9,500 commute out. Part of the sub-area lies in the Welsh Development Area and has experienced employment growth as a result and the rest of the industrial part of the sub-area has now been designated an Intermediate Area which should be a stimulating factor.

7.7. An important feature shown by the more detailed work described later in this chapter is that the Study Area is, to an extent, dependent on a few industrial sectors whose strength in turn depends a great deal on particular circumstances. Thus, while nationally the steel industry is reducing the number of its employees, the very modern works at Llanwern are unlikely to be affected as they already have a high output-to-worker ratio. The aircraft industry's future in the Study Area in the long-term will depend on the national economics of the industry but experience in North Gloucestershire has suggested that any decline would be compensated after a time by other growth, due to the availability of skilled labour and suitable premises free from idc control. The construction industry has been especially volatile and it is doubtful whether its remarkable growth at certain periods contributed permanently to the Area's inherent strength, especially as it employed a large number of migrant workers. Viewed as a whole however, the Area has a wide range of economic activities with a good share of the industries which have been expanding nationally such as mechanical engineering; food, drink and tobacco, and certain services such as education. On balance, therefore, the economy of the Area is now unlikely to suffer excessively in periods of national recession (but has certain key industries which remain vulnerable to specific major national decisions), while national expansion is likely to have very favourable consequences in terms of employment growth.

Population

7.8. In mid-1968 the civilian population in the Study Area was 1·7 million, 3·1 per cent of the Great Britain population. Of these, 0·9 million (54 per cent) lived in the Bristol-Bath sub-area, 0·5 million (28 per cent) in North Gloucestershire and 0·3 million (18 per cent) in Monmouthshire-Ross. Approximately 58 per cent of the population of the Study Area lived in built-up areas based on the main centres of population and two-thirds of these lived in the Bristol-Bath built-up area. Population growth for the Study Area at 15·4 per cent over the period 1951-66 was considerably greater than the 9·4 per cent for Great Britain as a whole (Table 7a) or for any of the standard regions other than East Anglia. Within this regional total, both North Gloucestershire and Monmouthshire-Ross increased at about twice as fast as Great Britain, and Bristol-Bath increased 33 per cent faster. Of this total growth, the share due to natural change (i.e. the excess of births over deaths) was very similar in the Study Area to that experienced in Great Britain, working out at just over 0·5 per cent a year. The main cause of the differential growth was migration.[15] Indeed 46 per cent of the Study Area's total change is due to migration. This was moreover, not new, since figures for an earlier period show that migration made up 56 per cent of the total change in population over the period 1931-51 (Table 7b). In the two years 1966-68 however, population growth on Severnside decreased due to a fall in net migration and the easing off of

(15) 'Migration' is more precisely the 'balance mainly due to net migration' since migration is calculated by deducting natural change from total change. This figure, therefore, includes the gross inward international migration and the net demobilisation figure of the armed forces, which for Great Britain in the period 1951-66 was a run-down of 417,000 or 75 per cent of the migrational balance; whereas for Severnside it was probably about 12,000 or only 12 per cent. The run-down of the armed forces for the area of Great Britain is allocated throughout Great Britain proportionately to the distribution of the country's population. The migrational balance of an area within Great Britain such as Severnside has an additional third component namely net migration with the rest of Great Britain.

Table 7a

Study Area and Great Britain: civilian population changes 1951-66*

Area	Civilian population 1951 '000	Total change '000	Total change %	Natural change '000	Natural change %	Balance mainly net migration '000	Balance mainly net migration %	Civilian population 1966 '000
Great Britain	48,348·4	4,548·7	9·4	3,999·3	8·3	549·4	1·1	52,897·1
Study Area	**1,417·5**	**217·6**	**15·4**	**118·4**	**8·4**	**99·2**	**7·0**	**1,635·1**
Bristol-Bath	791·1	100·6	12·7	56·6	7·2	44·0	5·6	891·7
North Gloucestershire	379·3	72·8	19·2	37·9	10·0	34·9	9·2	452·1
Monmouthshire-Ross	247·1	44·2	17·9	23·9	9·7	20·3	8·2	291·3

* Figures are on 1968 boundaries and are mid-year estimates.

Source: Office of Population Censuses and Surveys.

growth at Cwmbren New Town where the main period of growth wes 1951-66. Table 7c shows how the rate of growth has varied over the period 1951-68.

7.9. A comparison of the age/sex structure of Severnside and Great Britein shows a very similar pattern (Table 7d). In 1951 there was a slightly higher percentage of people of retirement age in the Area than in Great Britain as a whole end a slightly lower percentage of people in the younger working age brecket, 20-44. This difference had all but disappeared by 1966 due to the much younger age structure of the migrants into Severnside (Teble 7e) and the build-up of Cwmbran. Differences in the age structure of the population between the three sub-areas are small. Monmouthshire-Ross had the largest proportion of children and the smallest proportion of persons of retirement age throughout the period 1951-66—a reflection of the high rate of inward migration in the younger age groups. The Bristol-Bath sub-area had the smallest proportion of children and the largest proportion of persons of retirement age in the same period.

Table 7b

Study Area: civilian population changes 1931-51*

Area	Civilian population 1931 '000	Total change '000	Total change %	Natural change '000	Natural change %	Nat loss to Armed Forces '000	Nat loss to Armed Forces %	Balance mainly net migration '000	Balance mainly net migration %	Civilian population 1951 '000
Study Area	**1,226·1**	**191·4**	**15·6**	**97·9**	**8·0**	**−12·8**	**−1·0**	**106·3**	**8·7**	**1,417·5**
Bristol-Bath	682·1	109·0	16·0	50·7	7·4	−7·3	−1·1	65·6	9·6	791·1
North Gloucestershire	310·7	68·6	22·1	25·7	8·3	−3·3	−1·1	46·2	14·9	379·3
Monmouthshire-Ross	233·3	13·8	5·9	21·6	9·3	−2·2	−0·9	−5·6	−2·4	247·1

* Figures are on 1968 boundaries and are mid-year estimates.
Source: Office of Population Censuses and Surveys.

Table 7c

Study Area and Great Britain: civilian population changes 1951-68*

Area	Civilian population at beginning of period '000	Total change '000	Total change %	Natural change '000	Natural change %	Balance mainly net migration '000	Balance mainly net migration %	Civilian population at end of period '000
Great Britain								
1951-56	48,348·4	885·3	1·8	1,013·1	2·1	−127·8	−0·3	49,233·7
1956-61	49,233·7	1,803·7	3·7	1,300·1	2·6	503·6	1·0	51,037·4
1961-66	51,037·4	1,859·7	3·6	1,686·1	3·3	173·6	0·3	52,897·1
1966-68	52,897·1	582·5	1·1	653·9	1·2	−71·4	−0·1	53,479·5
Study Area								
1951-56	1,417·6	37·4	2·6	27·6	1·9	9·8	0·7	1,454·9
1956-61	1,454·9	82·5	5·7	37·7	2·6	44·8	3·1	1,537·4
1961-66	1,537·4	97·7	6·4	53·1	3·5	44·6	2·9	1,635·1
1966-68	1,635·1	24·7	1·5	19·8	1·2	4·9	0·3	1,659·8
Bristol-Bath								
1951-56	791·1	14·2	1·8	12·2	1·5	2·0	0·3	805·3
1956-61	805·3	40·8	5·1	18·2	2·3	22·6	2·8	846·1
1961-66	846·1	45·6	5·4	26·3	3·1	19·3	2·3	891·7
1966-68	891·7	11·1	1·2	9·9	1·1	1·2	0·1	902·8
North Gloucestershire								
1951-56	379·3	15·7	4·1	9·7	2·6	6·0	1·6	395·0
1956-61	395·0	23·8	6·0	12·3	3·1	11·3	2·9	418·6
1961-66	418·6	33·5	8·0	15·9	3·8	17·6	4·2	452·1
1966-68	452·1	8·8	1·9	6·0	1·3	2·8	0·6	460·9
Monmouthshire-Rosa								
1951-56	247·1	7·5	3·0	5·8	2·3	1·7	0·7	254·6
1956-61	254·6	18·1	7·1	7·2	2·8	10·9	4·3	272·7
1961-66	272·7	18·6	6·8	11·0	4·0	7·6	2·8	291·3
1966-68	291·3	4·8	1·6	4·0	1·4	0·8	0·3	296·1

* Figures ere on 1968 boundaries and are mid-year estimates.
Source: Office of Population Censuses and Surveys.

7.10. For East Severnside between 1961 and 1966 the South East was the most important source of migrants (Figure 3) providing over 25 per cent of the gross inward flow. The rest of the South West region and the West Midlands[16] were the second and third most important sources of migration into East Severnside with, not surprisingly, the rest of the South West being more important for the Bristol-Bath sub-area and the West Midlands being more important for the North Gloucestershire sub-area. The Monmouthshire-Ross sub-area and the rest of Wales combined were not an important source of migrants for East Severnside. On the other hand almost half

(16) The 'West Midlands' should strictly read 'rest of the West Midlands region' since it does not include the two local authority areas Ross-on-Wye UD and Ross and Whitchurch RD, both of which are in the Study Area.

Table 7d

Study Area and Great Britain: age/sex distribution of population 1951, 1961 and 1966*

%

Area	1951			1961			1966		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
Great Britain	100·0	48·0	52·0	100·0	48·3	51·7	100·0	48·6	51·4
0-14	22·4	11·4	11·0	23·2	11·9	11·3	23·3	11·9	11·3
15-19	6·3	3·1	3·2	7·0	3·5	3·4	7·6	4·0	3·8
20-44	36·4	17·9	18·5	32·5	16·2	16·3	31·6	16·1	15·8
45-64(m)/59(f)	21·2	11·1	10·1	22·6	12·2	10·4	21·7	11·9	9·8
65+(m)/60+(f)	13·8	4·5	9·2	14·7	4·5	10·2	15·2	4·6	10·6
Study Area	100·0	47·9	52·1	100·0	48·5	51·5	100·0	48·5	51·5
0-14	22·4	11·5	10·9	23·1	11·8	11·3	23·3	11·9	11·4
15-19	6·1	3·0	3·1	7·2	3·7	3·5	7·8	4·0	3·9
20-44	35·6	17·5	18·1	32·1	16·1	16·0	31·8	16·0	15·9
45-64(m)/59(f)	21·4	11·2	10·2	22·2	12·1	10·1	21·5	11·9	9·6
65+(m)/60+(f)	14·5	4·7	9·8	15·3	4·7	10·6	15·6	4·8	10·8
Bristol-Bath	100·0	47·2	52·8	100·0	48·0	52·0	100·0	48·2	51·8
0-14	22·1	11·3	10·8	22·4	11·4	11·0	22·7	11·6	11·1
15-19	5·7	2·7	3·0	7·2	3·7	3·5	7·6	4·0	3·8
20-44	35·4	17·2	18·2	31·8	15·9	16·0	31·9	15·9	16·0
45-64(m)/59(f)	21·8	11·3	10·5	22·6	12·2	10·4	21·8	11·9	9·7
65+(m)/60+(f)	14·9	4·7	10·3	16·0	4·8	11·2	16·9	4·7	11·2
North Gloucestershire	100·0	48·6	51·4	100·0	48·7	51·3	100·0	48·5	51·5
0-14	22·7	11·6	11·1	23·6	12·2	11·6	23·8	12·2	11·6
15-19	6·6	3·7	3·1	7·3	3·8	3·6	7·7	3·7	3·9
20-44	35·7	17·9	17·8	32·1	16·2	15·9	31·6	18·0	18·8
45-64(m)/59(f)	20·5	10·8	9·7	21·3	11·9	9·9	21·3	11·7	9·6
65+(m)/60+(f)	14·3	4·6	9·7	14·8	4·8	10·4	15·8	4·9	10·7
Monmouthshire-Ross	100·0	49·0	51·0	100·0	49·7	50·3	100·0	49·3	50·7
0-14	23·1	11·8	11·3	24·3	12·4	11·8	24·4	12·4	11·9
15-19	6·2	2·9	3·2	7·0	3·8	3·4	8·1	4·3	3·9
20-44	35·9	17·8	18·1	33·2	16·9	16·2	32·1	18·1	15·9
45-64(m)/59(f)	21·6	11·7	9·9	21·6	12·1	9·5	21·2	11·9	9·3
65+(m)/60+(f)	13·2	4·7	8·5	13·9	4·6	9·3	14·2	4·8	9·6

* Figures are on 1966 boundaries and are based on census enumerated figures except Great Britain 1966 which are based on mid-year estimates.
Source: Office of Population Censuses and Surveys.

Table 7e

Study Area: age distribution of migrants and residents 1966*

%

	1–14	15–44	45+
Migrants into the Study Area	23·9	57·5	18·6
Migrants out of the Study Area	23·7	57·9	18·4
Study Area population	23·3†	39·7	37·0

* The age distribution of migrants refers to migrants during the period 24 April 1965 to 24 April 1966.
† Population aged 0-14.
Source: 1966 Sample Census of Population.

Table 7f

Sub-areas: average annual migration 1961-66*

%

Area	Immigration	Emigration	Net migration
Bristol-Bath	2·1	1·3	0·7
North Gloucestershire	3·2	2·2	1·0
Monmouthshire-Ross	2·3	1·8	0·7

* Figures are average annual migration 1961–66 as a percentage of the base year population.
Source: 1961 and 1966 Censuses of Population.

Table 7g

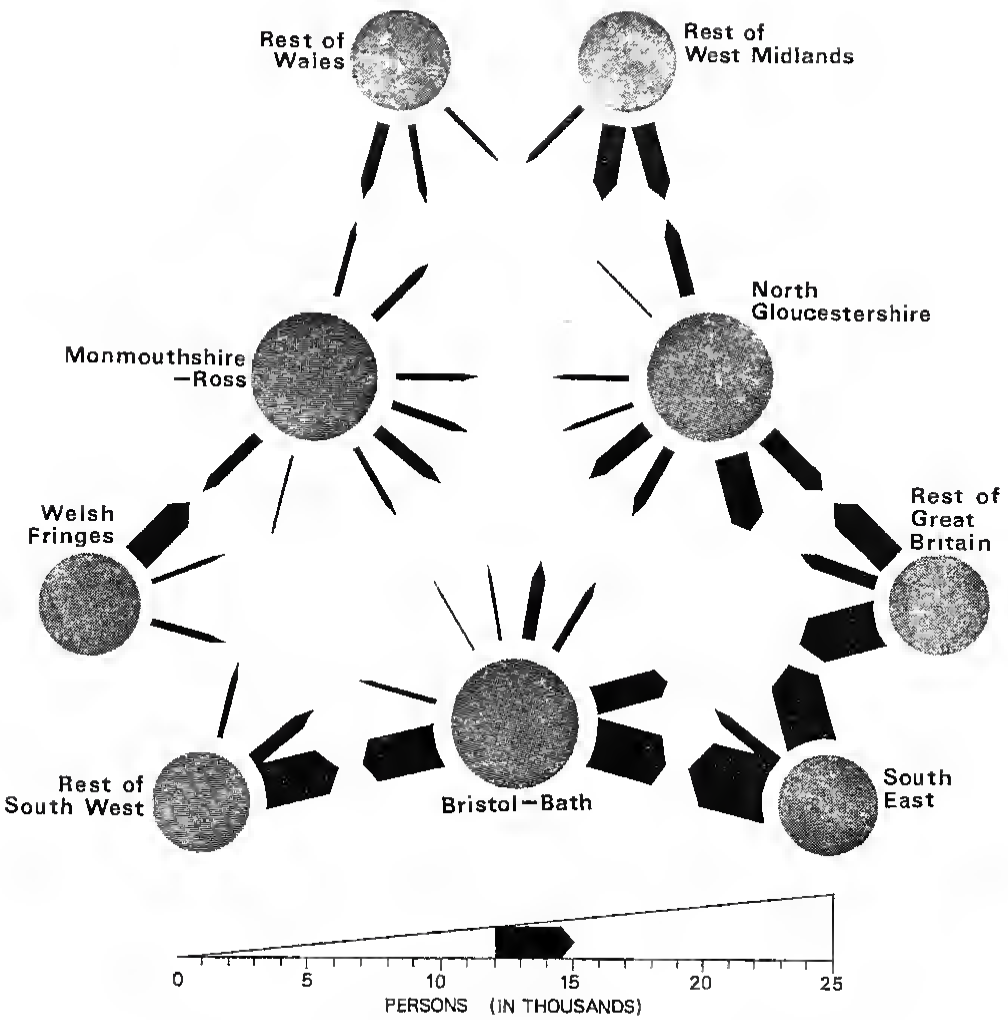
Five-year migration to and from sub-areas of the Study Area and other areas 1961-66*†

'000

From \ To	Total	Bristol-Bath	North Gloucester-shire	Monmouth-shire-Rose	Cardiff Coastal Belt	Monmouth Valleys	Glamorgan Valleys	Rest of Wales	Rest of South West Region	Rest of West Midlands Region	South East	Rest of Great Britain
Total		87·5	59·4	31·5	34·2	7·6	14·7	96·4	263·3	277·6	1,040·5	712·5
Bristol-Bath	56·2		3·4	0·5	1·1	0·1	0·2	1·5	16·3	3·8	18·7	10·7
North Gloucestershire	38·1	4·0		0·9	0·7	0·1	0·2	0·8	5·9	5·7	12·5	7·4
Monmouthshire-Ross	21·4	1·3	2·0		1·6	1·8	0·6	2·1	1·3	2·8	4·9	3·0
Cardiff Coastal Belt	31·3	1·6	0·8	2·5		0·5	2·9	5·7	2·0	2·4	7·4	5·5
Monmouth Valleys	15·5	0·4	0·4	6·6	0·9		1·7	1·3	0·3	1·1	1·8	1·0
Glamorgan Valleys	22·3	1·0	0·3	1·7	4·5	2·0		4·3	0·8	1·6	4·1	2·0
Rest of Wales	75·5	2·1	1·5	4·2	5·3	1·1	3·0		4·0	12·2	18·2	24·0
Rest of South West Region	154·7	16·3	5·3	1·3	1·3	0·2	0·5	4·0		9·8	80·4	35·7
Rest of West Midlands Region	211·9	8·2	9·0	3·1	1·9	0·3	0·8	13·1	19·7		66·7	89·1
South East	548·6	24·7	18·3	4·4	6·5	0·6	2·1	18·0	122·1	54·3		297·6
Rest of Great Britain	642·7	17·4	11·1	4·8	6·0	0·7	2·2	37·4	54·9	116·7	391·6	
Rest of World	807·2	10·5	7·1	1·7	4·4	0·3	0·6	8·3	36·0	67·3	434·2	236·8

* Figures may not add to totals due to roundings.
† Migrants aged 5 and over during the period 24 April 1961 to 24 April 1966
Source: 1966 Sample Census of Population.

Figure 3 Migration to and from the sub-areas 1961-66



Migrants aged 5 and over.

Source: 1966 Sample Census of Population.

the migrants into the Monmouthshire-Ross sub-area came from the Welsh Fringe Areas and the rest of Wales, with the Monmouth Valleys themselves providing 21 per cent of total inward migration, largely to Cwmbran. But even so, the South East and West Midlands regions provided a quarter of the inward migration into Monmouthshire-Ross. The pattern of migration out of Severnside was similar to the pattern of inward migration, with the rest of the South West region, the Welsh Fringe Areas, the rest of Wales, the South East and West Midlands being the major destinations. The flows between the three sub-areas were not very significant and tended to balance out.

7.11. In the period 1961-66 it is estimated from Census data that 166,500 migrants[17] entered Severnside and that 103,500 migrants left (Table 7g). Thus the population of Severnside increased in net terms due to migration by 63,000, i.e. an annual rate of nearly 12,600 persons. The 'balance mainly net migration' derived from the Registrar General's estimates of mid-year civilian population however, presents a figure of 45,000 for this period which is 70 per cent of the level of net migration obtained from the Census. It is difficult to account for the difference between these two figures, but they do imply an annual net inward migration to Severnside of between 9,000-12,600 persons. However, in relative terms the number of people entering or leaving Severnside in a year is a small part of the total population (Table 7f on page 65).

(17) The Census question was so framed that children aged under 5 who migrated with their parents were not included in the figures of gross migration. Nor could those who left Great Britain be recorded.

Table 7h

Study Area and Great Britain: percentage distribution of employees in employment 1968*

%

	Great Britain	Study Area	Development Areas	Non-Development Areas	South East	Non-South East
Males	**100·0**	**100·0**	**100·0**	**100·0**	**100·0**	**100·0**
Primary	5·7	3·8	9·7	4·6	1·8	7·6
Manufacturing	41·0	47·6	40·0	42·3	35·8	44·9
Construction	10·2	10·0	12·4	9·4	9·2	10·4
Services	43·2	38·8	37·8	43·8	53·2	37·0
Females	**100·0**	**100·0**	**100·0**	**100·0**	**100·0**	**100·0**
Primary	1·2	1·2	1·2	1·1	0·9	1·3
Manufacturing	31·5	28·1	29·9	32·3	25·9	35·1
Construction	1·1	1·0	1·0	1·0	1·2	1·0
Services	66·2	69·6	67·8	65·6	72·1	62·6

* For details of employees in employment 1952-68 see end of this Chapter, Annex 7A.
Source: Department of Employment and Productivity.

Table 7i

Study Area and Great Britain: unfilled vacancies 1961-68*

%

	Great Britain		Study Area		Bristol-Bath		North Gloucestershire		Monmouthshire-Ross	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
1961	1·0	1·3	1·3	1·5	1·0	1·4	1·9	1·9	1·1	0·8
1962	0·6	1·1	0·9	1·2	0·8	1·2	1·1	1·5	0·7	0·7
1963	0·5	1·0	0·7	1·0	0·6	1·1	0·8	1·1	0·7	0·5
1964	0·9	1·5	1·1	1·6	1·1	1·8	1·1	1·8	1·1	0·8
1965	1·1	1·6	1·1	1·7	1·0	1·7	1·4	2·2	0·9	1·2
1966	1·1	1·6	0·9	1·3	0·7	1·3	1·2	1·8	0·9	0·8
1967	0·7	1·0	0·0	1·0	0·5	0·9	0·0	1·2	0·4	0·8
1968	0·7	1·3	0·0	1·1	0·5	1·1	0·9	1·3	0·3	0·6

* Figures are mid-year unfilled vacancies as a percentage of total employees for persons aged 18 and over.
Source: Department of Employment and Productivity.

Table 7j

Study Area and Great Britain: wholly unemployed 1951-69*

%

	Great Britain			Study Area			Bristol-Bath			North Gloucestershire			Monmouthshire -Ross			Great Britain	
	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Total	M.	F.	Development Areas	Non-Development Areas
																Total	Total
1951	0·9	0·9	0·9	0·9	0·8	1·0	0·9	1·0	0·6	0·6	0·4	1·1	1·0	0·8	1·4		
1952	1·4	1·2	1·8	1·2	1·0	1·4	1·5	1·4	1·6	0·6	0·4	1·1	1·1	0·9	1·0		
1953	1·3	1·3	1·4	1·2	1·1	1·3	1·3	1·3	1·2	0·8	0·6	1·1	1·3	1·2	1·8		
1954	1·1	1·1	1·1	0·9	0·9	0·9	1·0	1·1	0·9	0·5	0·5	0·7	1·1	1·0	1·2	Not avalleble	
1955	0·8	0·8	0·9	0·7	0·7	0·7	0·8	0·9	0·9	0·5	0·4	0·9	0·7	0·8	0·8		
1956	0·8	0·9	0·8	0·7	0·7	0·7	0·8	0·9	0·6	0·6	0·5	0·8	0·8	0·7	1·0	1·8	0·6
1957	1·1	1·2	1·0	1·1	1·2	1·0	1·2	1·4	0·8	1·0	0·9	1·1	1·1	1·0	1·5	2·2	0·9
1958	1·7	1·9	1·4	1·6	1·8	1·4	1·7	2·0	1·1	1·4	1·4	1·5	1·8	1·7	2·1	3·3	1·3
1959	1·8	1·9	1·4	1·7	1·9	1·5	1·8	2·1	1·2	1·5	1·4	1·7	2·0	1·9	2·3	3·7	1·3
1960	1·3	1·5	1·1	1·3	1·4	1·1	1·4	1·7	0·9	0·9	0·9	0·9	1·4	1·2	1·8	3·0	0·9
1961	1·1	1·3	0·9	0·9	1·0	0·8	1·0	1·2	0·7	0·7	0·7	0·7	0·9	0·9	0·9	2·5	0·8
1962	1·6	1·9	1·2	1·4	1·6	1·1	1·3	1·5	0·8	1·5	1·5	1·4	1·7	1·8	1·5	3·4	1·2
1963	2·0	2·3	1·4	1·6	1·8	1·1	1·5	1·8	0·8	1·6	1·0	1·5	1·8	1·9	1·7	4·3	1·4
1964	1·4	1·6	0·9	1·0	1·1	0·7	1·0	1·2	0·5	0·9	0·9	0·9	1·1	1·1	1·1	3·1	0·9
1965	1·2	1·4	0·7	1·0	1·2	0·6	1·0	1·3	0·4	0·9	1·0	0·7	1·2	1·4	1·0	2·5	0·6
1966	1·1	1·3	0·6	1·1	1·3	0·0	1·1	1·5	0·5	0·9	1·1	0·7	1·2	1·3	1·1	2·3	0·8
1967	2·0	2·0	1·0	2·2	2·7	1·0	2·1	2·9	0·7	1·6	1·8	1·2	3·0	3·6	1·6	3·7	1·8
1968	2·2	2·9	0·9	2·2	2·9	1·0	2·1	2·9	0·7	1·7	2·1	1·1	3·2	4·0	1·0	3·8	1·8
1969	2·1	2·9	0·8	2·2	2·9	1·0	2·1	2·9	0·7	1·9	2·8	1·0	3·0	3·8	1·7	3·7	1·7

* Figures are mid-year wholly unemployed as a percentage of total employees.
Source: Department of Employment and Productivity.

Employment

7.12. The percentage distribution of employees in employment in 1968 in the Study Aree end Great Britain is set out in Table 7h. Details of employees in employment in 1952-68 for Great Britain, the Study Area and its three sub-areas are set out in Annex 7A on pages 89–118. In 1968 there were 623,000 people employed in the Study Area of whom 399,000 were men and 224,000 women. There were 253,000 people employed in manufacturing of whom 64,000 were in mechanical and electricel engineering, one of the faster growing industries of the manufacturing sector of the national economy. 43,000 were employed in the vehicle industry (mainly aircraft) and approximately 35,000 in each of the food and metal manufacturing (iron and eteel, light metals, end metel goods not elsewhere specified) industries. Employment growth in the Area over the perlod 1952-68 was 8·4 per cent for males and 26·5 per cent for females compared with the corresponding figures of 4·2 per cent and 21·7 per cent nationally. This large relative growth in mele employment opportunities on Severnside was due to a major increase of manufacturing jobs (Figures 4 and 5 on pages 70 and 71).

7.13. Throughout the 1960s the level of notified unfilled vacancies per employee was approximately the same as for Greet Britain (Table 7i). The unemployment rate throughout the 1950s and most of the 1960s was slightly lower in Severnside than in Great Britein but by 1967 it was marginally higher (Table 7j), largely due to increasing male unemployment in the Monmouthshire-Ross subarea (see Figure 6 on page 72).

7.14. Male employment grew roughly at the same rate as the male population aged 15 and above over the period 1951-66 both in Severnside and Great Britain, but the level on Severnside was approximetely 50 per cent higher (Table 7k). Male activity rates[18] therefore remeined broadly constant. Female employment grew much faster than the female population aged 15 and over on Severnside and in Great Britain and in both cases activity rates increased approximately 5 percentage points over 1951-66.[19]

(18) Activity rates are totel employees (employees in employment plus wholly unemployed) working in the erea es e percentage of the population aged 15 and over resident in the area. See Figure 7 on page 72 for employees in employment as a percentage of civilian population in the period 1952-68 for Severnside's sub-areas and Greet Britain.

(19) From Table 7l it would appear that Severnside activity rates are low except for males in Monmouthshire-Ross, but the Department of Employment end Productivity estimeted that activity rates on Severnside are not significantly different from national activity rates when allowance is made for under-recorded employment (see Footnote (22) on page 62).

Table 7k

Study Area and Great Britain: percentage changes of population aged 15 and over and total employees 1951-66

Area	Males		Females	
	Population 15 and over	Total employees	Population 15 and over	Total employees
Great Britain	9·7	9·4	7·0	21·7
Study Area	**16·0**	**15·1**	**12·3**	**30·7**
Bristol-Bath	14·9	14·6	9·2	27·6
North Gloucestershire	17·0	15·3	16·0	33·2
Monmouthshire-Ross	17·0	15·3	15·2	35·9

Source: Department of Employment and Productivity/Office of Population Censuses and Surveys.

Table 7l

Study Area and Great Britain: activity rates 1951 and 1966*

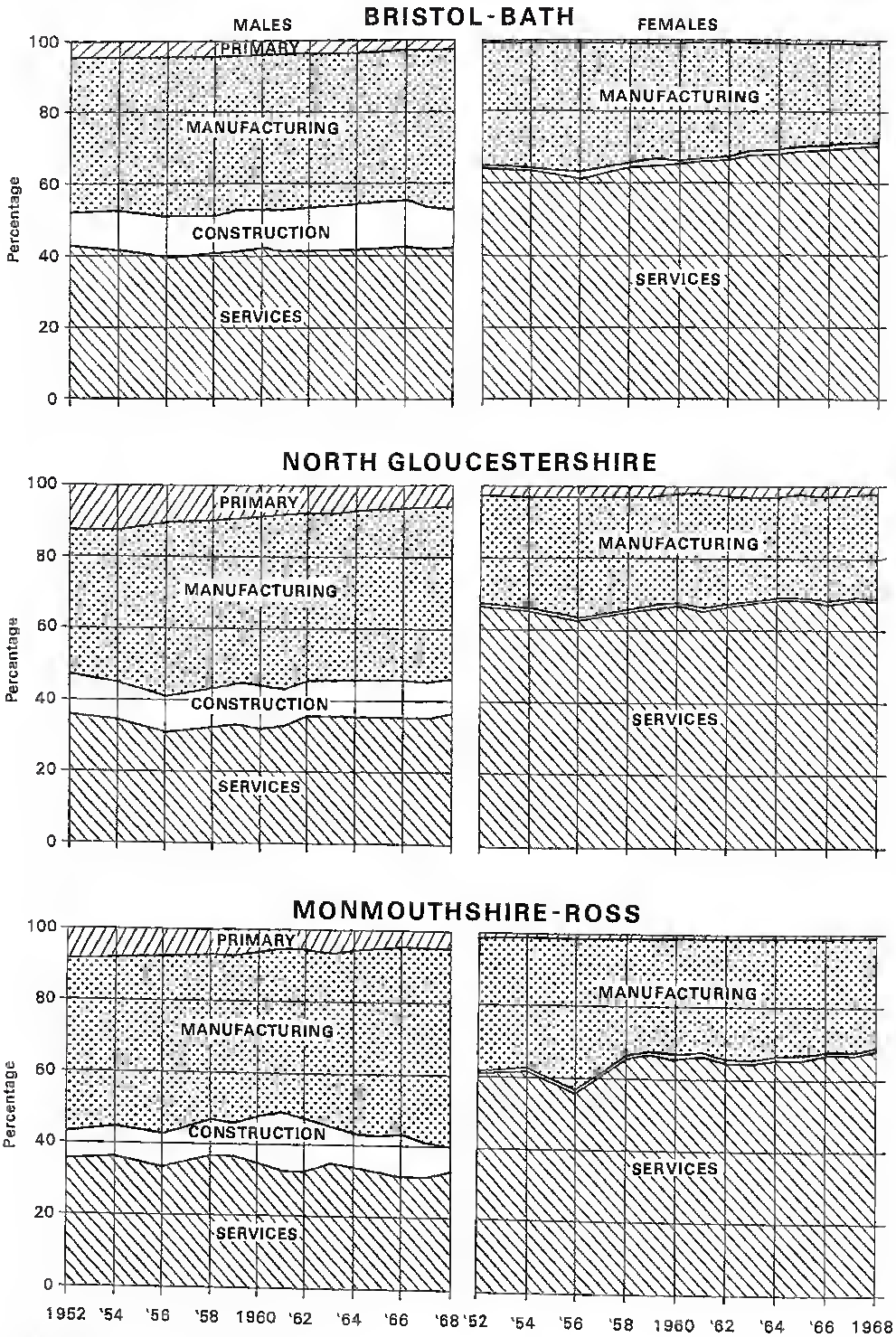
%

Area	1951		1966	
	Males	Females	Males	Females
Great Britain	76·9	35·6	76·7	40·5
Study Area	**71·8**	**29·9**	**71·1**	**34·8**
Bristol-Bath	69·6	29·7	69·6	34·7
North Gloucestershire	69·5	30·6	68·6	34·8
Monmouthshire-Rose	61·0	29·6	79·8	35·1

* Figures are total employees as a percentage of civilian population aged 15 and over.

Source: Department of Employment and Productivity/Office of Population Censuses and Surveys.

Figure 4 Sub-areas: percentage employment in major sectors 1952-68



Source: Department of Employment and Productivity.

Figure 5a Sub-areas as a percentage of Great Britain: manufacturing employees in employment 1952-68

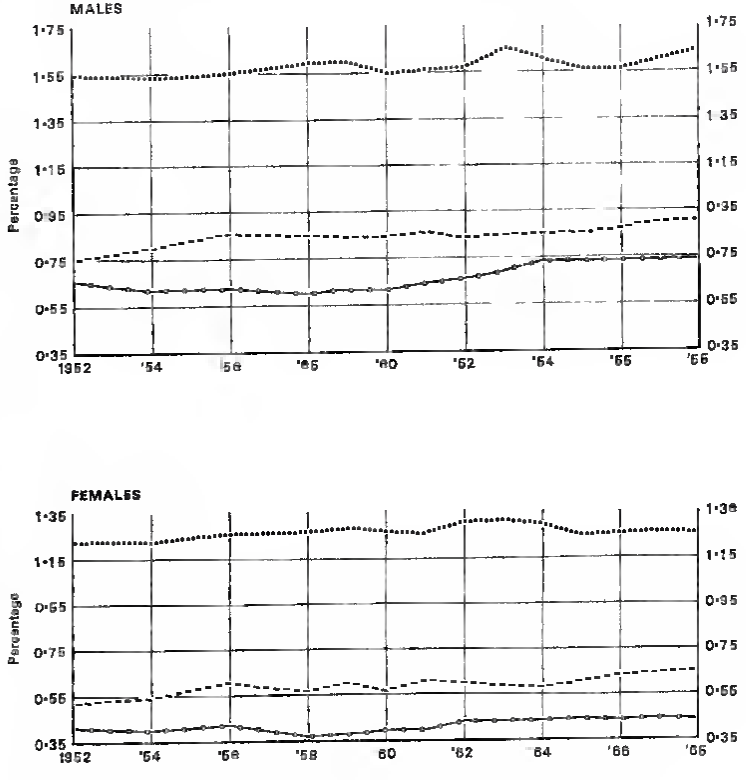
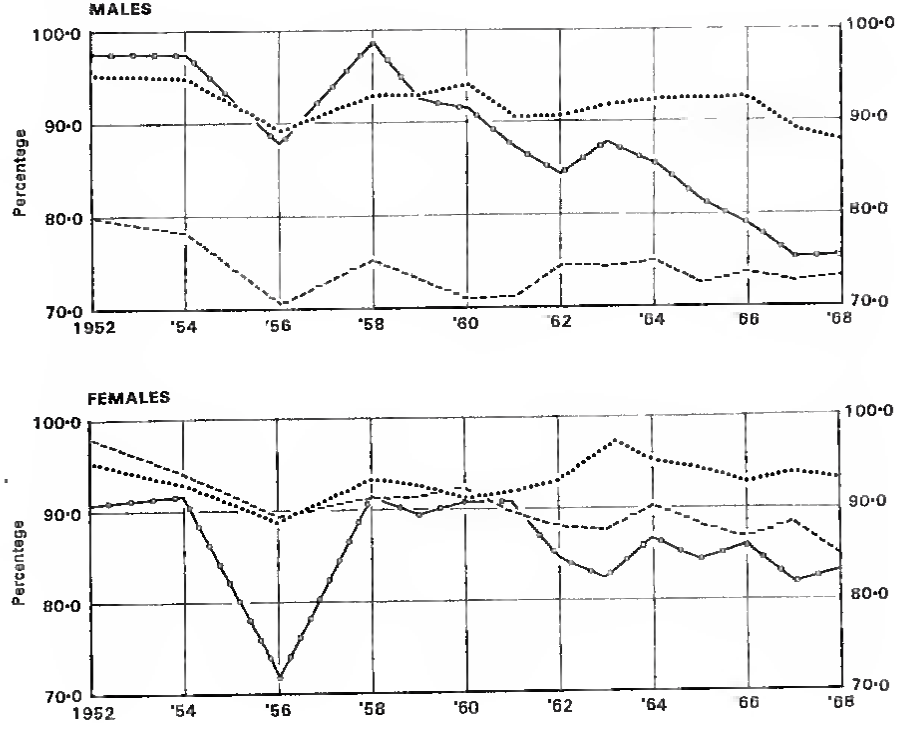


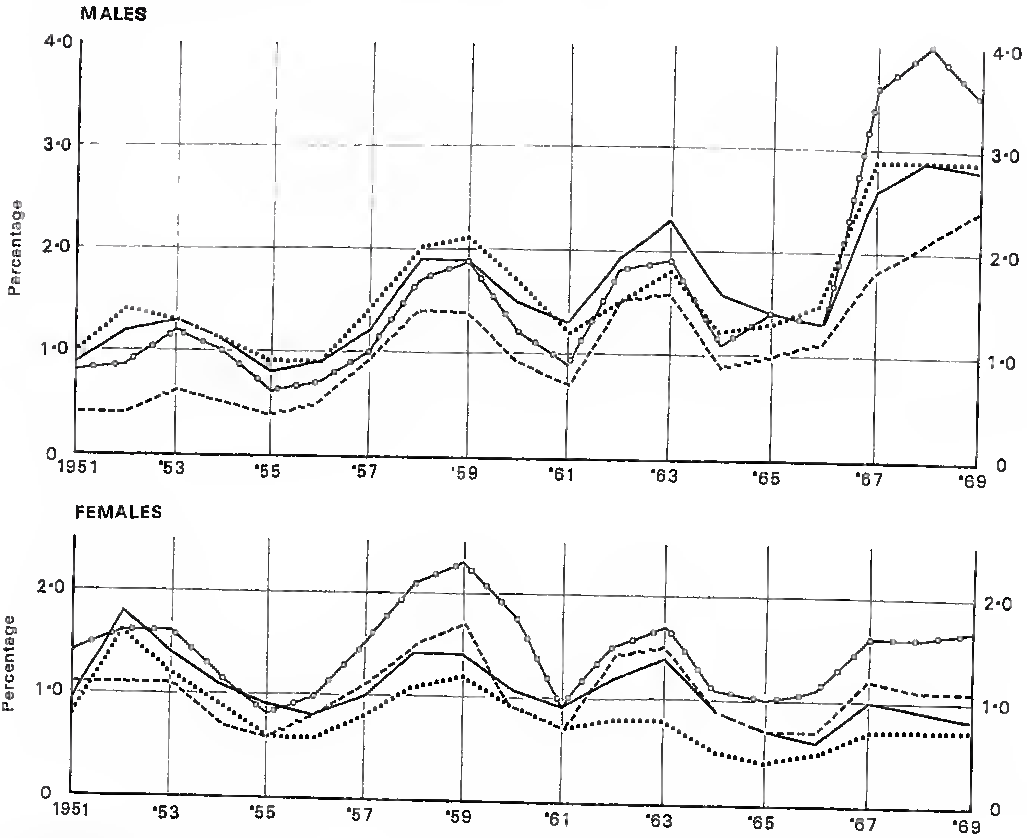
Figure 5b Sub-areas as a percentage of Great Britain: employees in employment in services per 1,000 population 1952-68



Source: Department of Employment and Productivity/Office of Population Censuses and Surveys.

Bristol - Bath .....
North Gloucestershire - - - - - -
Monmouthshire - Ross —o—o—

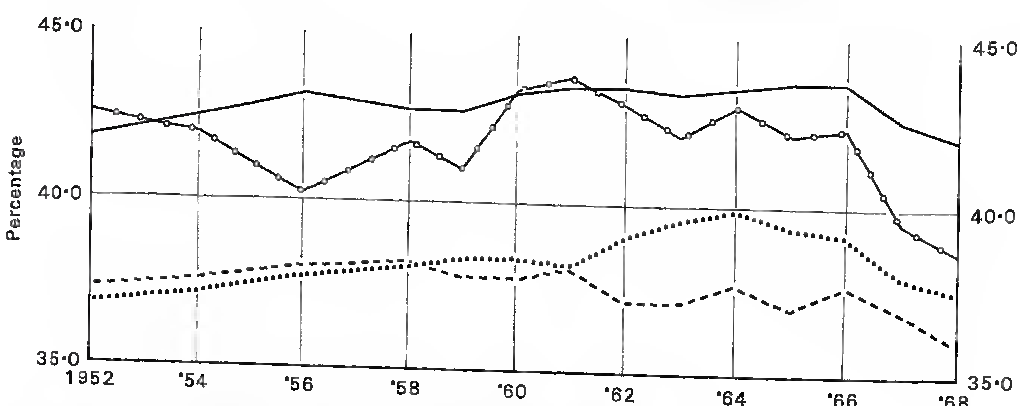
Figure 6 Sub-areas and Great Britain: unemployment rates 1951-69



Figures are mid-year (June) wholly-unemployed as a percentage of total employees; 1969 figures are provisional—for firm figures see Table 7j.
Source: Department of Employment and Productivity/Office of Population Censuses and Surveys

Bristol - Bath
North Gloucestershire
Monmouthshire - Ross
Great Britain

Figure 7 Sub-areas and Great Britain: employees in employment as a percentage of population 1952-68



Source: Department of Employment and Productivity/Office of Population Censuses and Surveys.

Earnings and incomes

7.15. Little is known about earnings and even less about incomes throughout Severnside but in general earnings are lower than nationally with the possible exception of males in Bristol and Newport in the Study Area and Cardiff in the Fringe Area. For most areas the national comparison is rather an extreme one since figures for the country as a whole are much influenced by those for the large South East region where earnings are well above the national average. In fact, average earnings on Severnside are running at about the same level as earnings in Great Britain excluding the South East region, so that male earnings in Bristol, Cardiff and Newport are higher than the average found outside the South East. These findings on earnings are consistent with the levels of unemployment and unfilled vacancies found on Severnside, which indicate that the pressure of demand for labour has generally been at about the national level (Table 7m).

Table 7m

Wales, the South West and South East Regions: average earnings of individuals relative to Great Britain*

Area	Males aged 18-64				Females aged 18-59			
	1964-65	1965-66	1966-67	1967-68	1964-65	1965-66	1966-67	1967-68
Great Britain—actual (£)	1,033·0	1,104·0	1,165·0	1,249·0	525·0	558·0	585·0	622·0
Great Britain	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0
South West	93·0	91·9	91·9	92·5	96·0	95·5	95·2	95·5
Bristol CB	99·2	98·7	97·0	100·5	96·2	97·1	93·9	93·9
Gloucestershire less Bristol	94·1	92·6	94·7	94·2	97·0	97·5	95·7	98·1
Somerset	91·4	92·0	89·0	90·0	100·0	95·0	99·0	96·1
Wiltshire	94·6	91·7	91·9	92·4	93·1	90·9	95·1	91·3
Wales	97·0	96·0	95·0	95·4	102·3	98·9	98·1	101·1
Cardiff CB	103·7	100·6	102·4	100·8	96·2	93·2	92·2	100·3
Glamorgan less Cardiff and Swansea‡	97·5	97·6	‖ 96·8	96·5	102·3	99·6	‖ 97·6	99·8
Newport CB	—	—	100·4	100·2	—	—	(87·4)†	(97·9)†
Monmouthshire less Newport‡	96·4	97·6	‖ 93·5	93·9	98·1	97·3	‖ 95·6	(105·2)†
South East	108·7	108·3	108·5	108·7	108·5	109·1	109·3	110·8
Great Britain less South East	96·0	96·3	95·5	96·1	95·4	95·1	94·7	94·3

* I Figures are based on persons with at least 48 contributions actually paid.

II The analyses are based on a sample of the population registered for national insurance, whether paying contributions to the graduated pension scheme or not.

III A 2 per cent sample of people with contribution cards covering the year to the beginning of March is maintained for general statistical purposes. From this sample, equal to about one-half of 1 per cent of the total number registered for national insurance the records of employed people aged 18-64/59 (men/women) were selected.

Iv The averages for Great Britain include some persons whose address was not known and who are therefore excluded from regional averages.

v All the averages include persons over retirement age and therefore differ slightly from the published figures in Table 48, Abstract of Regional Statistics.

† Figures in brackets are based on a sample of less than 100 persons, and should be treated with reserve. In these small samples the number in the highest group of earnings can be very erratic from year to year, and this has a marked effect on the average.

‡ A number of sub-regions were tabulated by the then Ministry of Social Security for the first time in 1966-67, but their inclusion involves a break in continuity in county remainders. These breaks in continuity are further indicated by the symbol ‖.

Source: Department of Health and Social Security.

Travel-to-work

7.16. The effect of travel-to-work flows on the calculated activity rates differed between the sub-areas. The 1961 and 1966 Censuses of Population show that the Bristol-Bath and North Gloucestershire sub-areas experienced a small net outflow of workers which would not significantly affect the activity rates. But Monmouthshire-Ross had a daily net inflow of over 11,000 workers

Table 7n

Study Area: net travel-to-work flows 1961 and 1966

Area	1961		1966	
	Males	Females	Males	Females
Study Area	**8,120**	**2,490**	**7,040**	**2,520**
Bristol-Bath	−2,470	−140	−340	−130
North Gloucestershire	190	−220	−1,430	60
Monmouthshire-Ross	10,400	2,850	8,810	2,590

Source: 1961 and 1966 Censuses of Population Workplace Tables

which represents approximately 10 per cent of the sub-area's working force and correspondingly inflates the apparent local activity rate (Tables 7n and 7o). When this is allowed for, the real activity rate of the indigenous population of Monmouthshire-Ross would appear to be at about the same level as in East Severnside and Great Britain.

Table 7o

Study Area and England and Wales: travel-to-work flows 1966

From \ To	Total	Bristol-Bath	North Gloucestershire	Monmouthshire-Ross	Monmouth Valleys	Glamorgan Valleys	Cardiff Coastal Belt	Rest of Gloucestershire	Rest of Somerset	Rest of Glamorgan	Rest of Monmouthshire	Wiltshire	Rest of England and Wales
Total		**11,450**	**9,370**	**20,860**									
Bristol-Bath	**11,920**		1,070				120	720	3,670	50	50	2,860	3,360
North Gloucestershire	**10,740**	1,700		1,190				2,070			130	830	4,820
Monmouthshire-Ross	**9,460**		1,130		1,430	70	2,750	350		270	1,510		1,950
Monmouth Valleys				11,580		4,220	1,540			550	1,290		440
Glamorgan Valleys				1,040	3,320		12,920			6,430	900		1,900
Cardiff Coastal Belt		90		2,220	310	3,630		50	70	2,090	350		1,380
Rest of Gloucestershire		840	2,130	300									
Rest of Somerset		2,930	60										
Rest of Glamorgan		130		860									
Rest of Monmouthshire		100	130	1,580									
Wiltshire		3,000	1,040										
Rest of England and Wales		2,660	3,610	2,090									

Source: 1966 Sample Census of Population Workplace and Transport Tables.

Self-employed

7.17. In both Severnside and England and Wales the number of self-employed males decreased and the number of self-employed females increased between 1951 and 1966 but the percentage of self-employed to total employment declined for both sexes in both cases. The figure for self-employed males in Severnside was 0·6 percentage points higher in 1951 and 0·5 percentage points higher in 1966 compared with the corresponding figure for England and Wales. For self-employed females the proportion was 0·5 percentage points higher in 1951 but by 1966 had fallen to 0·1 percentage points below, which is no doubt linked with the fact that the percentage of all females in employment on Severnside was by 1966 higher than that for England and Wales (Table 7p).

Table 7p

Study Area and England and Wales: self-employed 1951 and 1966

Area	1951				1966			
	Males		Females		Males		Females	
	'000	%*	'000	%*	'000	%*	'000	%*
England and Wales	1,217·5	8·8	283·6	4·6	1,112·9	7·9	329·2	4·2
Study Area	**41 5**	**9·4**	**9 0**	**5·1**	**41 0**	**8·4**	**10 3**	**4·1**
Bristol-Bath	21 8	9·3	5·0	4·9	21 5	8·2	5·6	4·0
North Gloucestershire	12 2	9·9	2·5	5·3	12·1	9 3	2·9	4·1
Monmouthshire-Ross	7·5	8·9	1·5	5·4	7 3	7·7	1·9	4·4

* Self-employed as a percentage of total in employment.
Source: 1951 and 1966 Censuses of Population.

Occupational structure

7.18. It has not been possible to make a detailed analysis of the occupational structure of Severnside because of limitations in the presentation of the Census data available in the Aree but the pattern is very similar to that of England and Weles. Proportionetely there are slightly more manual workers and slightly fewer managerial and professional workers on Severnside than nationally. The pattern of employment growth between 1961-66 when analysed by occupation is very similar for both Severnside and Englend and Wales. The fastest rates of growth for males took place in the managerial, professional, recreation, sport and other service occupetions and there were sharp reductions in manual workers, in particular, and in transport and communications. Female growth rates were very much higher nationally than male growth rates and even more so for most industries on Severnside. In perticuler the two largest femele occupations, clerical and recreation end sports services, together employing over half, grew by 22 per cent end 38 per cent respectively. Female manual workers on Severnside grew by 20 per cent es against 7 per cent nationally. The Industrial Survey data (Table 7q) suggests that manufacturing industry in the Study Area has a greater proportion of technical and administrative workers, particularly in Bristol-Bath, than in Greet Britain. By contrast, Severnside has a lower proportion of skilled workers,[20a] even in Bristol-Bath, than Great Britain and a lower proportion of semi-skilled[20b] than in Great Britein but a higher proportion of unskilled workers, especially in Monmouthshire-Ross. A direct comparison between this occupational break-down and that from Census data would be misleading, since the Industrial Survey covered only manufacturing industry end quarrying. The impact of the aircraft industry at Bristol and the steel industry at Llanwern on these proportions is apparent. Deteiled consideration of some of the main industries is given in Chapter 8 as a basis for the assessment of the Area's future.

Table 7q

Study Area and Great Britain: occupational structure 1966

%

Occupation	Great Britain†	Study Area*	Bristol-Beth*	North Gloucestershire*	Monmouthshire-Ross*
Total	**100**	**100**	**100**	**100**	**100**
Administrative, technicel end clericel	26	29	30	28	27
Skilled	30	24	28	23	17
Semi-skilled	24	20	18	22	23
Other	20	27	24	27	33**

Source: * Severnside Industrial Survey.
** Mostly iron and steel.
† Statistics on Income, Prices, Employment and Production March 1967 (HMSO).

The movement of manufacturing industry to Severnside

7.19. During the early post-war years, up to 1951, firms throughout the country were expanding and adjusting themselves to civilian markets and there was a widespreed willingness to consider new locations for production facilities. The inducements offered in Development Areas by the Government, the large number of wartime factories falling vacant (meinly in the Development Arees), and the evallability of labour in those places were significant considerations in meny location decisions. 50 per cent of the 'moves'[21] generating 64 per cent of the employment resulting from all inter-area movement in the United Kingdom went to the 'peripheral areas'—essentially whet are now the Development Areas—in the period 1945-51.

(20) a Three categories of employee constitute skilled workers:
i craftsmen in skilled occupetions whose entry hes been gained by normal methods i.e. apprenticeship or equivalent training;
ii production workers in occupetions where skill acquired by considerable experience or where minimum of six months training essential;
iii foremen and cherge hands not ellocated elsewhere.

b Semi-skilled are defined as:
production workers in occupations where degree of skill ecquired by experience and/or some training, including those requiring between 1 end 6 months experience end/or training before worker becomes reasonably proficient.

(21) *The Movement of Manufecturing Industry in the United Kingdom 1945-65* by R S Howard, HMSO (1966). A move is the opening of e manufacturing establishment in eny one of 50 ereas into which the United Kingdom wes divided for this purpose, where the origin of the development in question could be treced in e way defined to e location outside that area. The movement recorded includes both transfers of establishments, involving closure et e first location, and new branches, being additionel establishments of the firms concerned. It includes both establishments opened in new idc-approved premises end those opened elsewhere, meinly in second-hend premises. It excludes those cases which closed down by end-1966.

7.20. During this period, the main source of the rapid growth in manufacturing employment in East Severnside was industry already in the area: employment resulting from four (surviving) moves into Bristol-Bath from outside the erea during 1945-51 was still less than 400 in 1966 and nine moves into North Gloucestershire had generated employment for epproximately 1,500. In contrast Monmouthshire-Ross, a relatively small part of the Study Area but a significant part of which was then in a Development Aree, had 14 inward moves (7 requiring industrial development certificates and 7 not) in 1945-51 and they employed 14,400 in 1966.

7.21. Between 1952-59, efforts to promote movement to the Development Areas were pursued less vigorously and for most of the period the idc control was operated in a more relaxed manner in the non-Development Areas. In other words, elthough as a possible location for mobile industrial projects East Severnside was subject to less competition from Development Areas, there were in fact many fewer projects for which new locations were being sought outside the regions where they originated. Such applications for idc's to build on East Severnside as were received from firms not already established in that area were examined critically and few such firms moved into new premises there. Including those going into second-hand premises, there were 18 (surviving) moves into East Severnside, and they employed 5,000 workers in 1966, just over 2,000 in Bristol-Bath and just under 3,000 in North Gloucestershire (Table 7r). The two moves into Monmouthshire-Ross in this period resulted in e negligible emount of employment. However, throughout Severnside, applications by local firms for idc's to extend premises were approved in the great majority of cases. Thus the growth of manufacturing employment was assisted by the fairly liberal idc policy of the time and by the availability of premises.

7.22. The economic events of 1958-59 produced an increased desire to influence industrial location throughout the country generally. At varioue points in the 1960s additional inducements were introduced to attract firms to Development Districts and subsequently to the enlarged Development Areas. Also, the idc control was operated with increasing stringency particularly in the highly buoyant South East and Midlands. This was also the case in East Severnside. There were eight moves into Bristol-Bath in 1960-65 but they were relatively small ones and had resulted in fewer then 1,000 jobs by end-1966. The rundown of the aircraft industry, which released both premises and skilled labour made it possible for North Gloucestershire to attract 17 moves in the period and these were providing 4,700 jobs by 1966. Eight moves into Monmouthshire-Ross during 1960-65 led to only 1,100 jobs by 1966 and thus the level of inward movement into that sub-area did not reach anything like the same proportions as in the immediate post-war period. (Llanwern, which added 8,500 jobs, does not count as a 'move' by the definition of these statistics.) However, it is worth bearing in mind thet only the Pontypool Employment Exchange of the Monmouthshire-Ross sub-area is currently in the Development Area as compared with the larger area comprising Pontypool, Cwmbran end Newport in the late 1940s (Table 7r).

7.23. From 1966, there have been further increases in the scale of financial assistance and the renge of facilities offered to manufacturers in the Development Areas and in 1969 the Intermediate Arees were introduced. Against this background, pressure to move into Bristol-Bath has remained comparatively light, but in the last few years there has been a feir measure of interest in the Gloucester-Cheltenham area. The general policy hes been to limit strictly the amount of new industry coming into those parts of Severnside outside the Development (and now also the Intermediate) Areas. During the period 1966-68, North Gloucestershire appears to have continued to be relatively more successful in attracting firms, with eighteen inward moves generating employment for approximately 1,100 people in this 3-year period whereas there were only six moves to Bristol-Bath, generating employment for approximetely 400 people. In Monmouthshire there were nine inward moves creating approximately 500 jobs (Table 7s).

Table 7r

Study Area and United Kingdom: inward moves 1945-65*

Area		1945-51 Total	1945-51 IDC	1945-51 Non IDC	1952-59 Total	1952-59 IDC	1952-59 Non IDC	1960-65 Total	1960-65 IDC	1960-65 Non IDC	1945-65 Total	1945-65 IDC	1945-65 Non IDC
United Kingdom	Moves	933			901			1,180			3,014		
	Empl.	373·2			273·8			223·1			870·1		
Study Area	**Moves**	**27**	**10**	**17**	**20**	**7**	**13**	**33**	**13**	**20**	**80**	**30**	**50**
	Empl.	**16·3**	**9·9**	**6·4**	**5·2**	**2·3**	**2·9**	**6·5**	**1·8**	**4·7**	**28·0**	**13·9**	**14·1**
Bristol-Bath	Moves	4		4	8	2	6	8	4	4	20	6	14
	Empl.	0·4		0·4	2·1	0·3	1·8	0·8	0·7	0·1	3·2	1·0	2·2
North Gloucestershire	Moves	9	3	6	10	3	7	17	4	13	36	10	26
	Empl.	1·5	0·8	0·8	2·8	1·6	1·2	4·7	0·6	4·1	9·0	3·0	6·0
Monmouthshire-Ross	Moves	14	7	7	2	2		8	5	3	24	14	10
	Empl.	14·4	9·1	5·3	0·3	0·3		1·1	0·5	0·5	15·8	10·0	6·8
Peripheral Arees	Moves	463			214			475			1,162		
	Empl.	237·3			78·6			122·1			438·0		
South East, East Anglie and West Midlends Regions	Moves	275			514			465			1,254		
	Empl.	83·4			138·8			71·3			293·4		
Rest of the United Kingdom	Moves	168			153			207			528		
	Empl.	36·2			51·2			23·2			110·7		

* Employment is in thousands end refers to manufacturing employment at end 1966.
Source: Ministry of Technology.

7.24. The general picture of industrial movement and development (see Tables 7r, 7s and 7t) since the war is of initial rapid growth throughout Severnside, largely due in the Monmouthshire-Ross sub-area to an influx of jobs but due to local expansion elsewhere. Following this period the inflow of jobs to Monmouthshire-Ross has been almost negligible. North Gloucestershire and Bristol-Bath have generated most of their expansion, and indeed Bristol-Bath has been a net exporter of jobs. North Gloucestershire has had the highest growth rate in manufacturing employment and appears to heve been consistentiy the most attrective of the sub-areas to manufacturing industry from outside, but this mey have mainiy been because it had more empty factory space to offer.

Table 7t

Study Area and United Kingdom: manufacturing employment arising from inward moves 1945-65

%

Area	Manufacturing employment arising from inward moves	
	1945-65*	1952-65†
Bristol-Bath	2·5	23·2
North Gloucestershire	12·6	47·5
Monmouthshire-Ross	26·1	15·2
Peripheral areas	19·1	128·4
South East, East Angha end West Midlends Regions	7·2	33·8
Rest of England	7·6	102·0

* As a percentage of manufacturing employment mid-1956.
† As a percentage of the change in manufacturing employment 1953-66.
Source: Ministry of Technology/Department of Employment and Productivity.

Table 7s

Movement of industry to the Study Area 1966-68

Area	Totel			IDC			Non IDC		
	No. of moves	Males*	Total*	No. of moves	Males*	Total*	No. of moves	Males*	Total*
Study Area	33	1·4	2·0	15	0·7	1·1	18	0·7	0·9
East Severnside†	24	1·1	1·5	9	0·5	0 7	15	0·6	0·8
West Severnside‡	9	0·3	0·5	6	0·2	0·4	3	0·1	0·1

* Employment in thousands at mid-1969.
† Of the 24 moves to East Severnside, 6 were to Bristol-Bath end 18 to North Gloucestershire.
‡ Excluding Ross-on-Wye UO and Ross and Whitchurch RD.
Source: Ministry of Technology.

Trade flows

7.25. Part of the Industrial Survey consisted of collecting information based on the consignments made and received by establishments in the Study Area and on the destinations and origins of these consignments. The reeults of this consignment survey (Figure 8) enable a detailed picture to be built up of the flows of goods within Severnside and between Severnside and the rest of Great Britain and illustrate the extent of economic linkage.

7.26. The inward flows of goods as recorded from the consignments are flows of goods to manufecturing firms in response to their demand for raw materials and intermediate goods. The outward flows, on the other hand, consist of intermediete goods going to other manufacturing firms, intermediate goods going to non-manufacturing firms, and goods going for finel consumption. We did not record the destinations of sales by type of goods directly, but by subtracting the matrix of flows of raw meterials and intermediate goods from the matrix of flows of totel goods, a matrix showing flows of final demand goods and intermediate demand goods to the non-manufacturing sector is obtained. The flows of goods to the non-manufacturing sector to satisfy intermediate demand are probably small compared with the flows of goods for final demand and this deduced matrix has been assumed to represent a matrix of flows showing final demand.

7.27. The metrix of flows of intermediate goods (Table 7u) is important for showing the relative degree of area production linkages. All three sub-arees provide just over 10 per cent of their own intermediate needs. There is no evidence of any significant production linkages between the sub-areas of Severnside. The important links between Severnside and the rest of the country are: Bristol-Bath with the South East and imports from abroad; North Gloucestershire with the West Midlands, South East and Yorkshire and Humberside; and Monmouthshire-Ross with the rest of South Wales and imports (of iron ore) from ebroad.

7.28. The matrix of flows of total sales of all goods (Table 7v) shows Severnside's markets. Severnside consumes just over a fifth of its own goods but this is principally due to Bristol-Bath selling almost 30 per cent of its goods within the Study Aree (21 per cent within Bristol-Bath Itself).

Table 7u

Study Area: manufacturing and quarrying: purchases of raw materials and intermediate goods 1966

From \ To	Study Area		Bristol-Bath		North Gloucestershire		Monmouthshire-Ross	
	£ million	%	£ million	%	£ million	%	£ million	%
Total Purchases	**515·8**	**100·0**	**259·7**	**100·8**	**118·4**	**100·0**	**137·7**	**100·0**
Study Area	**92·1**	**17·9**	**50·6**	**19·5**	**22·0**	**18·6**	**19·5**	**14·2**
Bristol-Bath	44·1	8·5	36·8	14·2	6·2	5·2	1·1	0·8
North Gloucestershire	25·8	5·0	12·2	4·7	12·9	10·9	0·7	0·5
Monmouthshire-Ross	22·2	4·3	1·8	0·6	2·9	2·4	17·7	12·9
Rest of South West	22·5	4·4	15·5	6·0	6·3	5·3	0·7	0·5
Rest of South Wales	51·8	10·0	11·5	4·4	3·0	2·5	37·3	27·1
South East	64·3	12·5	38·5	14·8	17·3	14·6	8·5	6·2
West Midlands	62·5	12·1	21·4	8·2	24·9	21·0	18·2	11·8
North West	31·8	6·2	16·0	6·2	8·6	7·3	7·2	5·2
Yorkshire and Humberside	44·1	8·5	12·6	4·9	16·1	13·6	15·4	11·2
Rest of Great Britain	31·3	6·2	14·3	5·7	10·5	8·9	6·5	4·7
Rest of World	114·8	22·3	78·8	30·3	9·7	8·2	26·4	19·2

Source: Severnside Industrial Survey.

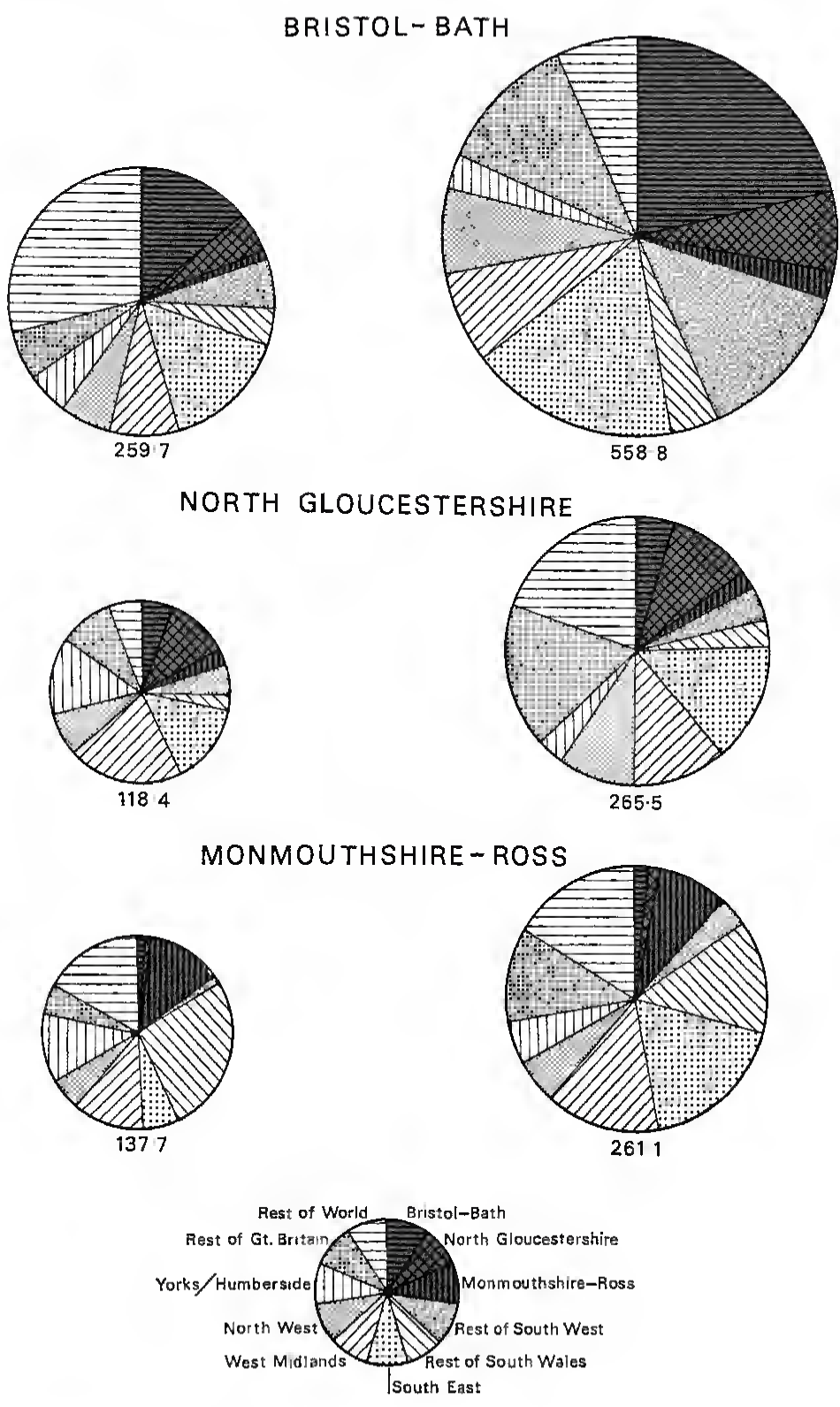
Table 7v

Study Area: manufacturing and quarrying: total sales 1966

From \ To		Total Sales	Study Area	Bristol-Bath	North Gloucester-shire	Monmouth-shire-Ross	Rest of South West	Rest of South Wales	South East	West Midlands	North West	Yorkshire and Humberside	Rest of Great Britain	Rest of World
Study Area	£ million	**1,085·4**	**238·2**	**132·8**	**65·9**	**39·5**	**94·9**	**64·3**	**181·6**	**106·3**	**78·2**	**36·3**	**138·2**	**145·5**
	%	**100·0**	**21·9**	**12·2**	**6·1**	**3·6**	**8·7**	**5·9**	**16·7**	**10·8**	**7·2**	**3·3**	**12·7**	**13·4**
Bristol-Bath	£ million	558·8	164·4	116·9	35·7	11·8	75·4	20·9	57·4	41·5	38·8	15·5	62·6	42·2
	%	100·0	29·4	20·9	6·4	2·1	13·5	3·7	17·4	7·4	7·8	2·8	11·2	7·6
North Gloucestershire	£ million	265·5	44·1	12·1	27·0	5·0	10·7	8·0	37·5	30·0	25·3	8·1	46·0	55·9
	%	100·0	16·6	4·6	10·2	1·9	4·0	3·0	14·1	11·3	9·5	3·1	17·3	21·1
Monmouthshire-Ross	£ million	261·1	29·7	3·8	3·2	22·7	8·8	35·4	46·7	36·8	14·0	12·7	28·8	47·4
	%	100·0	11·4	1·5	1·2	8·7	3·4	13·8	17·9	14·1	5·4	4·9	11·3	18·2

Source: Severnside Industrial Survey.

Figure 8 Trade flows 1966
Source: Severnside Industrial Survey.



7.29. The South East is an important markst for all three sub-areas and exports to the rest of the world are relatively important for North Gloucestershire and Monmouthshire-Ross. For the rest, sales are more evenly distributed throughout Great Britain than purchases of raw meterials and intermediate goods.

7.30. The matrix showing the flows of final demand goods between the thrse sub-areas (Table 7w) demonstrates the importance of Bristol to the Study Area. The consumption of final demand goods obtained from the Bristol-Bath sub-area is for both North Gloucestershire and Monmouthshire-Ross twice the consumption of final demand goods received from within the boundaries of their own sub-areas. As fer es the Study Area is concerned, Bristol-Bath produces 82 per cent of these goods, North Gloucestershire 13 per cent and Monmouthshire-Ross 5 per cent, compared with the consumption pattern in which Bristol-Bath consumed 56 per cent of the final demand goods produced in the Study Area, North Gloucestershirs 30 per cent end Monmouthshire-Ross 14 per cent. The consumption pattern approximates to the distribution of population, as might be expected. A comparison of consumption and production patterns for final demand goods shows that Bristol-Bath produces approximately 50 per cent more than it has consumed from all the goods produced in the Study Area (obviously goods produced outside the Study Area will be consumed also), whereas North Gloucestershire and Monmouthshire-Ross consume far more than they have produced.

Table 7w

Study Area: manufacturing and quarrying: final demand goods 1966*

From \ To		Study Area		Bristol-Bath		North Gloucestershire		Monmouthshire-Ross	
		£ million	%	£ million	%	£ million	%	£ million	%
Study Area	£ million	146·1		82·2		43·9		20·0	
	%		100·0		56·3		30·0		13·7
Bristol-Bath	£ million	120·3		80·1		29·5		10·7	
	%		82·3		54·9		20·2		7·3
North Gloucestershire	£ million	18·3		−0·1		14·1		4·3	
	%		12·5		−0·1		9·6		2·9
Monmouthshire-Ross	£ million	7·5		2·2		0·3		5·0	
	%		5·1		1·5		0·2		3·4

* This table is obtained by subtracting Table 7v from Table 7u for the respective areas.
Source: Severnside Industrial Survey.

Net output

7.31. Estimates of net output, particularly on a per employee or per unit of capital basis, would be highly desirable as an indicator of the efficiency of the Area's industriss. There are several definitions of net output and for some purposes the definition employed in the National Income Accounts would be most suitable. However, it has not been possible to estimate net output from the Industrial Survey material on a basis consistent with the definition used in the National Income Blue Book. The definition used here is the value of sales minus the purchases of raw materiels and fuel and the cost of transport (Table 7x). This also differs from the definition used in the Census of Production in that there an allowance is made for stock appreciation, receipts for work done and payments made to sub-contractors. However, when comparisons ars required, the Census of Production net output per employee figures for the United Kingdom will be used as being nearer than the National Income Blue Book estimates to the net output per employee figures estimated from the Industrial Survey.

7.32. The figures of net output per employee are subject to sampling errors and, as described above, are only an approximation to net output as defined in the Census of Production. Accepting the figures as a rough guide, however, East Severnside would appear to have e significantly higher net output per employee then the average United Kingdom value of £1,700 but Monmouthshire-Ross appears to be below the national average (Table 7y). The high net output achieved in the Bristol-Bath sub-aree is due to a favourable showing over the entire manufacturing sector, but in particular the vehicles industry (including aircraft). In net output

Table 7x

Study Area: manufacturing and quarrying: materials used in production: sales and net output 1966

£ million

Description	Value of materials used in production				Value of sales				Net output*			
	Study Area	Bristol-Bath	North Gloucester-shire	Monmouth-shire-Ross	Study Area	Bristol-Bath	North Gloucester-shire	Monmouth-shire-Ross	Study Area	Bristol-Bath	North Gloucester-shire	Monmouth-shire-Ross
Total	**536·5**	**267·6**	**129·7**	**139·1**	**1,968·9**	**549·7**	**258·7**	**269·5**	**472·2**	**261·5**	**119·7**	**91·9**
Mining and quarrying	2·6	2·0	0·0	0·8	9·5	7·2	0·4	1·9	5·8	4·7	0·3	0·8
Food, drink and tobacco	119·5	101·5	14·6	3·3	184·5	151·2	26·7	6·6	58·1	44·4	10·7	3·0
Chemicals and allied industries and metal manufacture	118·3	25·8	7·4	85·1	211·4	45·6	12·9	152·9	61·6	13·6	4·4	43·8
Engineering and electrical goods	102·8	25·5	62·6	14·7	206·8	60·4	115·3	31·1	99·6	33·6	50·4	15·6
Vehicles	65·3	46·3	6·7	10·2	178·1	129·8	26·8	21·7	110·6	81·9	17·5	11·2
Textiles, leather and clothing and footwear	42·7	15·5	19·9	7·3	82·4	34·0	36·2	12·2	36·4	17·9	14·7	3·8
Building materials	8·9	5·1	2·9	0·9	22·5	11·5	7·3	3·7	10·9	5·9	3·5	1·5
Paper	32·2	27·0	3·3	2·0	65·0	53·4	7·8	3·8	29·4	24·1	3·8	1·5
Other manufacturing	44·2	16·9	10·3	15·0	106·8	56·7	25·5	26·6	59·7	35·5	14·3	9·9

* These figures are an approximation to net output as defined in the Census of Production.

Source: Severnside Industrial Survey.

Table 7y

Study Area and United Kingdom: net output per employee in 1966 by area and type of business*

£'000

Description	United Kingdom†	Study Area	Bristol-Bath	North Gloucestershire	Monmouthshire-Ross
Total	**1·7**	**1·9**	**2·1**	**1·9**	**1·6**
Mining and quarrying less coal‡	2·4	2·8	3·0	4·0	1·9
Food, drink and tobacco	2·2	1·6	1·8	2·2	1·0
Chemicals and allied industries and metal manufacturing	2·3	1·9	2·2	1·6	1·9
Engineering and electrical goods	1·7	1·8	1·9	1·7	1·6
Vehicles	1·8	2·6	2·6	2·7	2·4
Textiles, leather and clothing and footwear	1·2	1·7	1·9	2·4	0·6
Building materials	1·6	1·4	1·6	1·4	1·1
Paper	1·8	2·1	2·1	1·8	1·7
Other manufacturing industries	1·6	1·8	2·0	1·6	1·5

* These figures are an approximation to net output per head as defined in the Census of Production.

† United Kingdom figures for manufacturing in 1966 were obtained by interpolation between the 1963 and 1968 Censuses of Production.

‡ United Kingdom net output per employee for mining and quarrying in 1966 was obtained by applying the growth in net output per employee between 1958 and 1963 to the 1963 Census of Production figure.

Source: Severnside Industrial Survey.

terms this is the largest industry in the sub-area with 31 per cent of total net output with a 40 per cent higher net output per employee than the same industry in the United Kingdom as a whole. This is not surprising since the proportion of aircraft in the output of the vehicle industry is much higher on Severnside than nationally. North Gloucestershire has a comparatively high net output figure for most industries. The figures for Monmouthshire-Ross are made relatively low by the performance of the chemical and metal manufacturing industry (which provides 48 per cent of net output in the sub-area) in the years examined. (Steel production at that time was not at full capacity.)

7.33. However, caution should be exercised before accepting what seems to be the obvious conclusion that the efficiency of industry in the Study Area is above the national average. There are three reasons for this. First, only labour productivity has been compared: no measurement of capital employed per unit of net output has been attempted. Next, although an attempt to allow for the effects of industrial structure has been made by taking broad groups of industry, this in itself is unsatisfactory since substantial differences in structure (and therefore output per head) can occur within the industrial groups used. Third, there are difficulties of interpretation that stem from using figures for a single year: for example, short-term changes in the economy may effect the three sub-areas differently: also figures for a single year can be affected by factors peculiar to particular industries, such as sharp changes in the prices of raw materials.

7.34. It is probable that the industrial structure does account for a part (perhaps large) of the greater labour productivity of East Severnside manufacturing industry, but it is possible that a residue remains which cannot be attributed to structure. This residue must be put down to either greater output per head under similar conditions, which would mean that labour was being used more efficiently on Severnside, or to greater output per head resulting from the use of more capital per man, indicating that higher labour productivity was being achieved by more capital intensive methods of production.

7.35. Caution in accepting the conclusions regarding the greater labour productivity on Severnside is also necessitated by the information on average earnings which shows that the level of earnings on Severnside was no higher than the national average, excluding the South East although this information relates to earnings in all industries, not eolely manufacturing industry (Table 7m on page 73).

Bristol-Bath

The 1968 situation

7.36. This sub-area is the most populous part, not only of the Area, but also of the whole South West region. it ie dominated by Bristol, which employed three-quarters of the 339,000 employees in the sub-area in 1968. Bath has a certain independence as a manufacturing, cultural and distribution centre with an influence reaching outside the Study Area. Weston-super-Mare and Clevedon are resorts on the Bristol Channel with small local manufacturing industries, but the rest of the sub-area is largely rural in character. The sub-area has, in general, shown self-supporting growth subject to the special considerations which apply to the aircraft industry. Communications with neighbouring regions have been improved by the completion of the Severn Bridge and the growth of the motorway network.

7.37. The structure of employment in Bristol-Bath in 1968 for men is similar to the national one, but for women the structure is comparable to that in the South East with a higher than national proportion of employment in the servica industries[22] (Tablee 7A.8 and 7A.9 on pages 96 and 97).

7.38. The *primary industries* are not important employers in the Bristol-Bath sub-area. The proportion employed in agriculture is less than nationally although there are important agricultural areas within the sub-area providing about 4,000 jobs. The small coal-mining industry centred on Midsomer Norton in Somerset has been declining steadily and employed just under 1,000 men in 1968. Coal-mining now accounts for less employment in the sub-area than other forms of mining and quarrying which have also declined slightly since 1952 (Table 7A.7 on page 95).

7.39. 96,000 men and 34,000 women were employed in *manufacturing industries* in 1968. This was a slightly higher proportion of male employment than nationally and a slightly lower proportion of female employment. The rate of growth in manufacturing employment over the period has been higher in the sub-area than nationally, particularly for men, with a growth of 14·2 per cent which la 7 percentage pointe higher than the corresponding growth nationally. The aircraft industry firms and those in the food, drink and tobacco trades employ well over 50,000 of the sub-araa's 130,000 in manufacturing. Tha paper, printing and publishing group employs another 21,000. All other industries amploy well under half of the manufacturing labour force, with a wide variaty of mechanical enginaering firms the most important elamant.

7.40. The aircraft industry is the largest male employer in the sub-area except for construction. There are some 23,600 jobs for men and some 2,400 jobs for women in this industry. The main part of this employment is at the aero-engine

(22) Employment (ERII) statistics for small areas, as provided by the Department of Employment and Productivity, under-record certain categories of employment such as civil servants who do not hold National Insurance Cards and 'unlocated' employees whose actual place of work is not identified but who are known to work elsewhere than the employment exchange area where their National Insurance Cards are exchanged. Not all industries are equally affected by this problem: the largest underestimates are likely to be in transport and communications, public administration, distribution, insurance, banking and finance.

works of Rolls-Royce (formerly Bristol Siddeley Engines Ltd.) and tha British Aircraft Corporation at Filton, Bristol. Besides their major work in connexion with Concorde, BAC carry out other airframe and space work at Filton. This industry is subject to national decisions about the role of tha aircraft industry in the national economy and is not amanable to ordinary economic forecasting. The food, drink and tobacco industry with 14,700 male and 11,100 female amployees have proportionately double Great Britain's share of employment, and growth rates have been higher than nationaily, particularly for males. Tobacco and cigaratta manufactura is concentrated in Bristol itself; grain milling and animal food production are to be found largely at Avonmouth, while nearby, Keynsham is the main locality for the cocoa and chocolata industry and draws its labour from a large catchment area. Engineering is spread throughout the sub-area producing a wide renge of products including packaging, printing and paper converting machines, construction and mechanical handling plant, cranes and deck machinery. Although located mainly in Bristol, engineering is also an important activity at Bath (cranes, lifting gear and electrical instruments) and in such smaller places as Clevedon (components for the motor industry) and Yate (electrical machinery and domestic appliancas). Paper (including box-making) and printing are important industries in Bristol-Bath, each providing over 10,000 jobs, mainly in Bristol but also in Bath and Paulton which are important printing centres. Iron and steel and chemicals are proportionately less important in Bristol-Bath than nationelly, but capital-intensiva installetions at Avonmouth are of growing importance in the production of zinc, sulphuric acid, fertilisers, ethylene glycol, ammonia and carbon black. Both Bristol and Bath have substantial industries engaged in the manufacture of footwear and women's foundation garments.

7.41. The proportion of manufacturing employment engaged in the production of capital goods is the same as nationally although almost half of this employment in Bristol-Beth is in aircraft manufacture. The proportion engaged in non-durable consumer goods is higher than nationally due to tha large food, drink and tobacco industry centred on Bristol. The sub-area has a very small final consumer durable goods industry, contributing rather to component supply.

7.42. *Construction* with almost 24,000 male employees in 1968 had a slightly higher share of male employment than nationally.

7.43. With 53 per cent of total employment, *service employment* was slightly higher then for Great Britain, but this was made up of a substantially higher percentage for women (71 per cent) compared with nationally (66 per cent) and a slightly lower percentage for males—42 par cent compared with 43 per cent. Bristol-Beth's above average female employment in service industries is partly axplained by its proportionately larger share of employment in education and health services which reflect Briatol's position as regional sarvice centre. Wholesale distribution also has a higher percantage of employment than Great Britain which shows Bristol's importance both in size and in relation to the communications network to the South West region. The insurance, banking, finance, professionel and sclentific services appear to be under-represented in the sub-area. Tha under-representation of local government employment probebly reflects the absance of county council heedquerters other than those of Bristol County Borough itself. However, public administration employs substantial numbers of people at Government regional offices in Bristol and the Admiralty Headquartar Branch in Bath, but these are not recorded in the statistics (sae Footnote (22) on page 82).

Changes 1952-68

7.44. Total amployment in the Bristol-Bath sub-area graw between 1952 and 1968 by 15·9 per cent made up of a growth of 10·1 per cent for males and 27·4 par cent for females—very much higher ratas than the comparable Great Britain figures of 10·2 per cent, 4·2 per cent and 21·7 per cent respectively. Within these totels the main growth sectors wera manufecturing (14 per cent growth) and construction (31 per cent) for men, and servicas (41 per cant) for women. All these ratas were significantly above the national change. Male employment in primary industry declined a little faster than nationally (though the absolute figures are small) and grew less than nationelly in service employment.

7.45. The industries with the biggest absoluta increase in the area were, for men: aircraft (9,500), construction (5,500), education (5,200), paper (2,700), retail distribution (2,100), insurance, banking, finance (2,000), electrical engineering (1,900) end miscellaneous services (1,900). Other substantial increases occurred in metal goods, gas, electricity and water, and food, drink and tobacco groups. For women tha biggest incraases by far were in aducation (9,100), medical and dental (7,300), and retail distribution (6,600). The rates of increese in almost every one of these industries were appreciably higher than nationally, in some cases markedly so.

7.46. The main industries of absolute decline were, for man: railways (3,800), coal (2,400), agriculture (2,000) and transport (other) (1,800), but for women the only large fall was in catering (1,900). These all followed national trends except transport (othar) in male amployment but tended on the whola to be proportionately highar, possibly reflecting the highar than national growth of employment in other industrias. (The fall in netional Govarnment employmant for women shown in Tabie 7A.9 is probably misleadlng—see Footnote (22) on page 82.)

7.47. Betwean 1952-68 tha most dramatic period for employment growth was in the aarly 1960s whan both male and female growth rates were three times the national. The other period of high growth for males was 1952-59. The remaining periods were mainly of declina, following the national trend except in the period 1964-66 when there was a small national growth. The industrias with the most notable changes for men ware aircraft which took on large numbers up to 1964, the construction industry which reached a peak in 1964 of 30,000 and then declined to 24,000 in 1968 and the service sector which shed 4,300 between 1966 and 1968.

7.48. Female employmant in the period 1963-66 grew much mora slowly than nationel rates, possibly on a backlash from the dramatically high rate of growth in 1960-63. Otherwise growth rates

from year to year were much on national lines.

7.49. Twenty industrial moves into the sub-area over the period 1945-65 had provided just over 3,000 manufacturing jobs by the end of 1966, which represented 2·5 per cent of all manufacturing employment in the area at that time (Table 7r, page 76). Moves out of the sub-area during the same period gave rise to 8,000 jobs. Not only has the area been a net exporter of jobs, but of the increase of 12,500 jobs in manufacturing between 1952-66, only 2,900 or 23 per cent were the result of inward moves. In this respect the sub-area has behaved similarly to the Midlands and the South East, which besides being net exporters of jobs, also generated the bulk of their increase in manufacturing employmant by the growth of 'indigenous' firms. In contrast, in the rest of the country the employment ganerated by moves between 1952 and 1966 was actually greater than tha total increase in manufacturing employment in the period.

Recent trends and prospects

7.50. In the second half of the 1960s the Bristol-Bath area shared in the national down-turn of economic activity. The unemployment rate doubled with the increase mainly in males—though the rate is still comparatively low. Employment has decreased, particularly in the construction industry, also the distributive trades. In the manufacturing sector there have been some closuree and redundancies, but the position has generally been sound, and overall, employment in the sactor has continued to increase. Office employment in Bristol appears to have continued to grow substantially and major office construction is currently under way. Prospects for the area's principel specialisations in the manufacturing sector, mechanical angineering, food, drink and tobacco, and packaging and printing are in the main good. The particular circumstances of the powerful aircraft industry are not, as mentioned earlier, susceptible to normal prediction. This sector is dealt with in more detail in tha next chapter (paras. 8.25-8.32).

North Gloucestershire

The 1968 situation

7.51. The sub-area of North Gloucestershire lies astride the heed of the Severn estuary. Although treated as a single sub-area, it consists of four distinct aections for employment purposes. The main Gloucester/Cheltenham/Stroud complex is well industriallsed with particular dependence on metal-using industries. Gloucester and Cheltenham, centred nine miles apart, together have approximately 60 per cent of the sub-area's 168,000 employees and attract a considerable daily movement of workers from other parts of North Gloucestershire. The picturesque Stroud Valley also has e surprising concentration of manufacturing with sizeable engineering and textile firms employing just over 10,000. The Cotswold country round Moreton-in-Marsh and Northleach to the east le hilly and rural; although distant from the Severn estuary, it cannot be distinguished statistically from Chaltenham and is therefore included as part of the main sub-area without separate mention. On the west side of the estuary, the Forast of Dean presants special problems caused by tha rundown of the once dominant coal-mining industry and special reference to thia area is made.

7.52. The structure of male employment in North Gloucestershire in 1968 ie somewhat similar to the male structure of employment in Great Britain outside the South East but with a greater emphasis on manufacturing. The structure for women in the sub-area is, however, more comparable to the structure of femele employment in the South Eest.

7.53. The proportion employed in the *primary industries* in 1968 in North Gloucestershire is comparable to that of Great Britain, although within this sector agricuiture and forestry ere relatively vary much more important than in Great Britain. The National Coal Board collieries in the Forest of Dean have ceased production altogether and the mining of coal has dwindled to smell-scele activities of Free miners who retain traditional rights to work private gales.[23] Other forms of mining and quarrying are now a more important activity in the sub-area than coal-mining.

7.54. *Manufacturing industries* in the sub-area provided jobs for 52,000 men and 17,000 women in 1968. This represents a very much higher proportion of total male employment than in Great Britain, but a somewhat lower proportion for females.

7.55. Mechanicel engineering[24] is for male employment the largest industry in the sub-area accounting for over 20 per cent of all male employment. A few lerge nationally known firms ara prominent but there is a good base of small and medium-size establishments. Although there is still a significant textile industry at Dursley and Stroud, the historical importance of the West of England cloth trade in the Cotswolds is declining and giving way to a developing men-made fibre element at Gloucester, the only development of its kind in the South West. The aircraft industry, although only half the size it was in 1952, etill employs nearly 5,000 men in Gloucester/Cheltenham, which represents just under 5 per cent of total mala employment in the sub-area. The food, drink and tobacco industry is fairly prominent in the erea, dominated by a very large ice-cream producing unit at Gloucester and a substantial

(23) Term ueed in the Forest of Dean eree to denote e place to mine.

(24) Mechanicel engineering employment statistics include shipbuilding, but this is virtually non-existent throughout Severnside—in North Gloucestershire it is less than 1 per cent of the employment in the mechenical engineering grouping.

soft drinks industry at Coleford. Other industries which have contributed to the boom in manufacturing employment in North Gloucestershire are chemicals, electrical engineering and metal goods.

7.56. The proportion of manufacturing employment engaged in the production of capital goods is very large, approximately 60 per cent compared with an estimate of 45 per cent nationally. As a consequence the proportion of manufacturing employment in consumer goods, materials and intermediate goods is lower than nationally.

7.57. The *construction industry* with a labour force of 11,000 employees has a slightly lower proportion of employees in this industry than nationally. This probably arises from the absence of any large-scale projects since the Berkeley Nuclear Power Station was completed.

7.58. Male *service employment* at 36 per cent of total employment was one point lower than for Great Britain excluding the South East. Male employment in insurance, banking, finance, professional and scientific services is under-represented with 2·9 per cent of employment as compared with the national figure of 4·2 per cent. Female service employment in the sub-area is proportionately higher than nationally, particularly in education, medical and dental services.

7.59. The Forest of Dean is so unlike the remainder of North Gloucestershire that a special note on its employment is merited. As in the neighbouring Welsh Valleys, which it partially resembles, its economy was for long depressed by the rundown of the coal-mining industry. The situation there would undoubtedly have been serious had enlargement and diversification of manufacturing industry in the area not been enabled to go ahead, and opportunities for work in the not too distant Gloucester/Cheltenham area been available. Enough new employment has been provided in the manufacturing, construction and service sectors to offset the contraction in mining though daily travel-to-work out of the area is still substantial, probably involving about 4,600 workers, equivalent to about 26 per cent of employees attributed to the area.

Changes 1952-68

7.60. Employment in North Gloucestershire grew over this period by 14·3 per cent with male employment growing at 8·8 per cent and female at 25·4 per cent—appreciably higher than the Great Britain rates of 10·2 per cent, 4·2 per cent and 21·7 per cent respectively. Manufacturing was by far the fastest growing sector for men with a 27·5 per cent increase compared with the national figure of only 6·9 per cent while services with a 12 per cent increase were slightly below the national rate. The construction industry, which grew nationally, declined in this area. For female employment the service sector's growth of 29·2 per cent was below the national rate, but on the other hand manufacturing employment grew by 18·4 per cent as against a national decline of 2·3 per cent.

7.61. By far the most significant absolute increase over the period was in mechanical engineering (11,700 jobs for men and 2,300 for women). This one industry provided 60 per cent of the increase in male and 50 per cent of the increase in female manufacturing employment. Other appreciable increases for men occurred in local government (2,700), textiles (2,100), education (1,900), motor repairs (1,300), metal goods (1,100), professional services (1,100), and food, drink and tobacco (1,000). There were major declines in the aircraft industry (6,300) and, in line with national trends, in coal-mining (3,600) and agriculture (2,600). Gains in female employment include education (6,100), medical and dental (2,800) and retail distribution (2,200).

7.62. Between 1952 and 1968 the one period of steady growth in male employment in this sub-area was from 1952 to 1958 when it was twice the national rate. This was followed by a period of marked fluctuations from 1958 to 1966 with serious declines in 1958-59 and 1961-62 in which the aircraft industry was a major factor, although the growth of mechanical engineering was moving in the opposite direction. The recessions were somewhat ahead of the national declines at these times and over the period (1958-66) as a whole the net growth was slightly above national. 1966-68 has been a period of national decline in employment which the sub-area has shared, but has not declined quite so sharply (2·6 per cent as against 3·8 per cent).

7.63. Female employment grew fairly steadily throughout the period 1952-66 in both the manufacturing and service sectors. 1966-68 saw a small loss of about 500 jobs mainly due to a fall in the mechanical engineering industry, but the percentage fall was less than the national rate.

7.64. Thirty-six industrial moves into the North Gloucestershire sub-area over the period 1945-65 accounted for 9,000 manufacturing jobs by the end of 1966, which represented 13 per cent of all manufacturing employment in the sub-area in 1966 (Table 7r, page 76). This proportion is less than that of the Development Areas but greater than that of the other areas of the United Kingdom. The employment generated in other places by moves out of the sub-area has been minimal. The total increase in manufacturing employment of 15,800 jobs over the period 1952-66 included 7,500 jobs (or almost 50 per cent) arising from inward moves. The proportion of self-generated increase in manufacturing employment is thus lower than in Bristol-Bath, and even more so than for the Midlands and South East, but it compares very favourably with that of the rest of the United Kingdom outside these prosperous areas.

Recent trends and prospects

7.65. Since January 1968 there has been a sustained run of notified redundancies much heavier than the area has experienced for a long time. In Gloucester, Cheltenham and Stroud alone, between January 1968 and November 1969, 51 redundancies were notified involving 5,100 workers, apart from a number of cases where labour forces were run down through normal wastage without recourse to formal redundancy. Just over 4,000 of the jobs were lost in manufacturing industries. About half of the cases notified involved the complete closure of the undertaking and most of these resulted from rationalisation decisions taken outside the area to centralise production in parent plants elsewhere, mainly the Home Counties and the Midlands. Only one company moved to an 'incentive area'—in Northern Ireland. Cancellation of contracts (including defence) and reductions in orders caused some of

the partiel run-downs in labour forces but few of the complete closures (other than in non-manufacturing activities such as construction). As a result of the redundencies some of the pressure has gone out of the labour situation. Employment in those manufacturing firms from Gloucester and Stroud which render monthly returns of employment under the Statistics of Trade Act 1947, hes fallen by about 3,000 since January 1968 but in the erea as e whole the total employment decline hes been smaller, suggesting that some degree of redeployment has taken place. Indeed there are grounds for believing that this shake-up is now over and that the decline is levelling off. In the Forest of Dean, where the local outlook is better than at any time for many years, unemployment has been well balow the average for Great Britain and for the rest of North Gloucestarshire.

Monmouthshire-Ross

The 1968 situation

7.66. This sub-erea is not as self-contained in eithar the social or economic sanse as the other two sub-arees. The south-west of the area, which includes Pontypool, Cwmbran and Newport, is highly industrialised: the remainder, comprising Abargavenny, Monmouth, Chepstow and Ross-on-Wye is largely rural in character and supported mainly by agriculture, tourism and a few scattered light manufacturing factories and rural craft workshops. About 17 per cent of the sub-area's employees work in these largely rural areas as against 83 per cent in a variety of industries in its industrialised south-wast. Newport, the largest town in Monmouthshire, is the principal industrial centre but Cwmbran and Pontypool are also important. Newport docks are being rapidly modernised and expanded to provide improved cargo-handling facilities. There ere close ties or inter-relationships between this eree and the adjoining mining valleys of Monmouthshire which it serves by providing major services, cultural and edministrative facilitiee and to a considarable extent, employment opportunities. It is in its turn influenced by Cardiff which has the wide range of services end facilities normelly present in a main provincial centre—in this case, the administrative capital of Wales.

7.67. Government influence of one form or enother has, ovar the years, contributed quite substantially to the attainment of the area's current level of economic prosperity. The wertime establishment of cartain substantial menufacturing plants began the transformation and decisions to build a new town at Cwmbran and to establish the large steel plant near Newport are further examples in the 1950s and early 1960s. Later, during the 1960s, the area north of Cwmbran became part of the newly designated Welsh Development Area with all the edvantages of those Areas. The recent designation of most of the remainder as part of the South East Wales Intermediate Area is a further measure that will influence its rate of economic growth. The establishment of Government offices in the area as part of the Government's dispersal programme has improved employment in the offices sector.

7.68. The structure of employment in 1968 for men was heavily oriented towards the manufacturing sector, much more so than Great Britain even excluding the South East and approaches the level of concentration in manufacturing of the West Midlands region. This is due to the heavy concentration of employment in steel in the sub-erea. The structure for female employment is similar to the national structure for females but with a slight emphasis towards a larger service sector as in tha South East. In 1968 thera were 4,000 employees in the *primary sector*, many of whom were employed in coal-mining.

7.69. *Manufacturing*, with 42,000 males and 12,000 femalas in 1968, accounted for 54·3 per cent of male employment and 30·4 per cent of female employment. Thus male employmant in manufacturing was proportionately very much more important in Monmouthshire-Ross than in Great Britain and had the highest proportion of male manufacturing employment of the three sub-areas. The proportion of females in manufacturing is similar to that of Great Britain. The largest male-employing industry in the sub-area is iron and steel, accounting for approximately 20 per cent of all male employment mainly in the Spencer Steelworks outside Newport. The second largest manufacturing industry is mechanical engineering (4·8 per cent) while the textile industry employs over 4,000 (3,600 males and 700 females).

7.70. The proportion of manufacturing employment engagad in the production of capital goods and non-durable consumer goods is roughly two-thirds the national proportion, while the proportion of employment engaged in producing materials and intermediate goods is, at 50 per cent, approximately twice the national average.

7.71. The *construction industry* has experienced wida fluctuations in its levels of employment in recent years. In 1968 the proportion employed in the industry was 1·3 percentage points below the national average.

7.72. The counterpart of the high proportion of employment in manufacturing in this sub-area is the relatively low proportion of men employed in *services*—33 per cent. For women, the proportion employed in the service sector is similar to thet of Great Britain although with an allowance for under-recording of public employment the proportion would be higher. The insurance, banking, finance, professional and scientific services ere under-represented for both males and females compared with Great Britain. The proportion employed in local government is highar than in Great Britain and is due to the existence of the county council offices in the area. Female employment in education, medical and dental services is proportionately greater than in Great Britain.

Changes 1952-68

7.73. Employment growth in Monmouthshire-Ross over this whole period was below the national average for total employment (9·7 per cent against 10·2 per cent) and for males (3·4 per cent—4·2 per cent), but for females it was somewhat higher (25·0 per cent—21·7 per cent). However, male employment in manufacturing grew appreciably faster (at 17·6 per cent) than nationally: the comparatively low performance was in construction and the service sector. Employment in construction in fact rose to a peak of 14,300 in 1961 with the building of the Spencer Steelworks but was back to nearly its 1952 level of 6,000 in 1968. The absolute decline in service employment was mainly due to the rationalisation of the railways, and the failure of a number of professional (including education) and clerical services to grow at the national rate. Female employment growth was very largely concentrated in the service sector, which grew at very close to the national rate, although there was also a small increase in manufacturing as against a national decline.

7.74. The iron and steel industry made the largest contribution to growth of male employment over the period providing 5,300 new jobs. This was due to the completion of the Spencer Steelworks in 1962. Mechanical engineering contributed growth of 1,800 jobs and there were appreciable increases in vehicles, textiles, the gas, electricity and water group and motor repairs. The chemical industry reduced its male labour force by 36 per cent due largely to the closure in 1966 of the Royal Naval Propellant Factory at Caerwent. Apart from railways there were also falls in line with national developments in coal-mining and, although to a lesser extent than nationally, in agriculture.

7.75. The growth of female employment was mainly concentrated in medical and dental (2,600), education (2,400), retail distribution (2,200) and smaller increases in most other service employment. Changes in the manufacturing sector were minor in absolute terms, the largest being the loss of 1,000 jobs in chemicals for the same reason as with male employment in this industry.

7.76. During this period the broad trends in male employment were somewhat out of line with national movements. Over 1952-59, employment dropped as against a national increase. 1959-61 produced a rapid rise (associated with the growth in construction) and 1961-66 a slower one. From 1966-68 male employment fell sharply by 7,200 or 8·5 per cent which was much worse than the national fall of 3·8 per cent. Construction accounted for 4,000 of this loss and manufacturing industry for 2,000. The growth in female employment was fairly steady right up to 1966, but from 1966 to 1968 there was a loss of 1,000 jobs, or twice the national rate of fall, mainly in the manufacturing sector.

7.77. Twenty four industrial moves into the sub-area over the period 1945-65 created some 15,800 manufacturing jobs by 1966 which represents 29 per cent of manufacturing employment in 1966. Some 14,400 of these genereted manufacturing jobs arose from moves in the immediate post-war period 1945-51. Manufacturing employment actually only increased by 9,200 jobs in the period 1952-66 and even this was assisted by some 8,500 jobs at the Spencer Steelworks. If this scheme, although it strictly does not classify as a move, is discounted then there has been virtually no net growth in indigenous manufacturing employment in the sub-area over the period 1952-66. The position for Monmouthshire-Ross has been unfavourable being next to the Welsh Development Area and thus unable to compete with the financial incentives that this area can offer to attract industrialists. This has been recognised and parts of Monmouthshire are now included in an Intermediate Area.

Recent trends and prospects

7.78. For the sub-area as a whole, redundancy notifications, excluding those in coal-mining, during 1969 were running at a slightly higher rate than in 1968 but were substantially less than in 1967. There were over 1,000 employees made formally redundant in 1969 but nearly 900 of them were notified in September and October, including the Tirpentwys Colliery which subsequently merged in November 1969 with Hafodyrynys with a loss of some 500 job opportunities, but only approximately 80 actual redundancies. The July 1970 rate of unemployment in the Pontypool/Cwmbran travel-to-work area was 4 per cent, compared with 3·5 per cent for the whole of Wales. Pontypool and Cwmbran have good prospects for industrial growth with over 2,400 manufacturing jobs in prospect, but these developments may result in only a gradual reduction in the level of unemployment because one-third of all males wholly unemployed in the travel-to-work area are over 55 years of age.

7.79. The signs are that Newport also has good prospects for growth and the new Business Statistics Office now being established will provide many clerical jobs to counter-balance the present high proportion of manufacturing industry. It is now planned to build another blast furnace at the Spencer Steelworks where there is a potential for yet further growth. July 1970 unemployment in the Newport travel-to-work area at 3·1 per cent is below the Welsh figure. The rest of Monmouthshire-Ross is largely rural and little change is expected in its employment level. The Heads of the Valleys road enables residents of Abergavenny to travel to work in Ebbw Vale and Brynmawr, where industrial developments are planned. It is too early to judge the effects of Intermediate Area incentives but some industrial growth should result.

Conclusions

7.80. The main economic characteristics of Severnside drawn from consideration of a sufficiently long period, 1952-68, which has included both more and less favourable times, are summarised here for convenience:

(i) population in all three sub-areas has grown much faster than nationally due to substantial net inward migration, the percentage rate

of growth in Bristol-Bath having been lower than the other two sub-areas;

(ii) the structure of male employment is heavily oriented towards manufacturing in North Gloucestershire and Monmouthshire-Ross, but Bristol-Bath's employment structure is more like the national industrial structure. Special features are the large aerospace industry in Bristol-Bath, the high level of mechanical and instrument engineering in North Gloucestershire and iron and steel in Monmouthshire-Ross;

(iii) male employment over the period grew vigorously in East Severnside at more than twice the national rate of growth, but in West Severnside growth has been below the national level. Growth has been fairly widely spread amongst industries in the Bristol-Bath area, but was particularly concentrated on mechanical engineering in North Gloucestershire and iron and steel in Monmouthshire-Ross. Female employment in all parts of Severnside has grown appreciably faster than nationally;

(iv) since 1945 there has not been a large inflow of mobile industry into East Severnside and growth in manufacturing industry can be considered to have been largely self-generated. West Severnside would have seen a substantial decline in manufacturing employment but for the inflow of mobile industry and the decision to build the Spencer Steelworks at Llanwern;

(v) the construction industry produced large swings in employment in all sub-areas at various times;

(vi) the western part of Monmouthshire-Ross has recently received Intermediate Area status. Pontypool employment exchange area is already part of the Welsh Development Area;

(vii) activity rates on Severnside are at about the national level;[25]

(viii) average earnings on Severnside are about the same level as in Great Britain as a whole outside the South East region;

(ix) each sub-area provides just over 10 per cent of its own raw materials and intermediate goods and there is no evidence of any significant production linkages between the sub-areas of Severnside. The strongest external links are with the West Midlands and the South East;

(x) Bristol-Bath purchases 21 per cent of its own manufacturing output, but otherwise Severnside is not a particularly important market for its own production;

(xi) the Area as a whole stood up well to the decline in employment levels which took place nationally in the 1966-68 period. It has had some difficulties recently but these seem likely to be temporary;

(xii) broadly the economy of the Area now has barriers to soften the effects of national recession, but could be adversely affected by major decisions in particular industries. It is likely to do well in a period of national expansion.

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(25) See Footnote (19) on page 69.

Annex 7A—Related Tables

Great Britain—total: employees in employment 1952-68* TABLE 7A.1

Description	'000		%		% change 1952–68
	1952	1968	1952	1968	
Total	**20,556·5**	**22,645·3**	**100·0**	**100·0**	**10·2**
Primary	1,828·2	898·9	7·9	4·0	−44·8
Agriculture, forestry and fishing	755·8	413·6	3·7	1·8	−45·3
Coal-mining	791·0	425·2	3·8	1·9	−46·2
Mining and quarrying (other)	81·4	60·1	0·4	0·3	−26·2
Manufacturing	8,161·1	8,473·9	39·7	37·4	3·8
Food, drink and tobacco	792·2	784·1	3·9	3·5	−1·0
Chemicals and allied industries	488·6	495·3	2·4	2·2	1·4
Iron and steel, tubes, castings, etc.	449·8	434·7	2·2	1·9	−3·4
Light metals, copper, brass, etc.	157·8	138·7	0·8	0·8	−12·1
Shipbuilding and mechanical engineering	1,411·6	1,545·0	6·9	6·8	9·5
Electrical engineering	603·0	875·8	2·9	3·9	45·2
Vehicles less aircraft	816·6	563·8	3·0	2·5	− 8·6
Aircraft	192·8	242·8	0·9	1·1	25·9
Metal goods not elsewhere specified	480·0	560·9	2·3	2·5	16·9
Textiles	911·6	687·2	4·4	3·0	−24·6
Leather, clothing and footwear	866·9	544·2	3·2	2·4	−18·4
Bricks, pottery, glass, cement, etc.	337·1	336·9	1·6	1·5	− 0·1
Timber, furniture, etc.	287·4	295·9	1·4	1·3	3·0
Paper	174·1	228·3	0·8	1·0	31·1
Printing and publishing	341·4	401·2	1·7	1·8	17·5
Other manufacturing industries	250·2	339·6	1·2	1·6	35·7
Construction	1,289·1	1,538·4	6·3	6·8	19·3
Services	9,478·1	11,734·1	46·1	51·7	23·8
Gas, electricity and water	371·9	410·6	1·8	1·8	10·4
Railways	531·4	290·1	2·6	1·3	−45·4
Road transport	487·5	490·0	2·4	2·2	0·5
Transport (other)	750·6	897·2	3·7	4·0	19·5
Retail distribution	1,475·7	1,979·9	7·2	8·7	34·2
Distribution less retail	690·3	804·8	3·4	3·5	16·6
Insurance, banking, finance, professional and scientific services less education, medical and dental	737·4	1,086·3	3·8	4·8	47·3
Miscellaneous services, less catering and motor repairers	968·1	1,110·2	4·7	4·9	14·7
Catering, hotels, etc.	665·1	574·1	3·2	2·5	−13·7
Motor repairers	258·9	419·9	1·3	1·9	62·2
Education	603·4	1,307·8	2·9	5·8	116·7
Medical and dental	599·5	965·3	2·9	4·3	81·0
Government: national	609·1	581·9	3·0	2·6	− 4·5
Government: local	729·0	816·0	3·5	3·6	11·9

* Figures may not add to totals due to roundings.
Source: Department of Employment and Productivity.

Great Britain—males: employees in employment 1952-68*

TABLE 7A.2

Description	'000		%		% change 1952–68
	1952	1968	1952	1968	
Total	**13,576·2**	**14,159·8**	**100·0**	**100·0**	**4·2**
Primary	1,507·9	800·3	11·1	5·7	−46·0
Agriculture, forestry and fishing	654·3	335·7	4·8	2·4	−48·7
Coal-mining	776·7	409·8	5·7	2·9	−47·2
Mining and quarrying (other)	76·9	54·8	0·8	0·4	−28·7
Manufacturing	5,418·6	5,794·0	39·9	41·0	6·0
Food, drink and tobacco	455·0	446·9	3·4	3·2	− 1·8
Chemicals and allied industries	349·3	359·1	2·6	2·5	2·8
Iron and steel, tubes, castings, etc.	401·7	390·1	3·0	2·8	− 2·0
Light metals, copper, brass, etc.	121·8	111·5	0·9	0·8	− 8·5
Shipbuilding and mechanical engineering	1,185·0	1,263·3	8·7	8·9	6·6
Electrical engineering	370·2	534·1	2·7	3·8	44·3
Vehicles less aircraft	522·5	489·1	3·8	3·6	− 6·4
Aircraft	163·3	206·9	1·2	1·5	26·7
Metal goods not elsewhere specified	301·2	373·3	2·2	2·6	23·9
Textiles	386·7	340·6	2·8	2·4	−11·9
Leather, clothing and footwear	205·3	156·4	1·5	1·1	−23·8
Bricks, pottery, glass, cement, etc.	252·2	262·6	1·0	1·0	4·1
Timber, furniture, etc.	230·4	237·7	1·7	1·7	3·2
Paper	100·6	145·2	0·7	1·0	44·3
Printing and publishing	225·7	271·2	1·7	1·0	20·2
Other manufacturing industries	147·7	207·0	1·1	1·6	40·1
Construction	1,244·6	1,446·6	9·2	10·2	16·2
Services	5,405·1	6,108·8	39·8	43·2	13·0
Gas, electricity and water	334·2	353·2	2·5	2·6	6·7
Railways	491·6	267·4	3·6	1·9	−45·6
Road transport	418·8	427·6	3·1	3·0	2·1
Transport (other)	612·5	712·1	4·6	5·0	16·3
Retail distribution	633·1	702·5	4·7	6·0	11·0
Distribution less retail	472·0	531·6	3·6	3·8	12·7
Insurance, banking, finance, professional and scientific services less education, medical and dental	429·3	597·0	3·2	4·2	39·1
Miscellaneous services, less catering and motor repairers	273·0	382·1	2·0	2·7	39·5
Catering, hotels, etc.	176·6	203·0	1·3	1·4	14·0
Motor repairers	226·2	330·7	1·7	2·3	46·2
Education	206·0	407·5	1·5	2·9	97·8
Medical and dental	166·9	231·9	1·2	1·6	38·9
Government: national	428·0	370·9	3·2	2·6	−13·3
Government: local	536·0	591·1	3·9	4·2	10·3

* Figures may not add to totals due to roundings.

Source: Department of Employment and Productivity.

Great Britain—females: employees in employment 1952-68*

TABLE 7A.3

Description	'000		%		% change 1952–68
	1952	1968	1952	1968	
Total	6,980·3	8,494·5	100·0	100·0	21.7
Primary	120·3	98·6	1·7	1·2	−18·0
Agriculture, forestry and fishing	101·5	77·9	1·6	0·9	−23·3
Coal-mining	14·3	15·4	0·2	0·2	7·7
Mining and quarrying (other)	4·5	5·3	0·1	0·1	17·8
Manufacturing	2,742·5	2,879·0	39·3	31·5	— 2·3
Food, drink and tobacco	337·2	337·2	4·8	4·0	0·0
Chemicals and allied industries	139·3	136·2	2·0	1·8	— 2·2
Iron and steel, tubes, castings, etc.	48·1	44·6	0·7	0·5	— 7·3
Light metals, copper, brass, etc.	36·0	27·2	0·5	0·3	−24·4
Shipbuilding and mechanical engineering	226·6	281·7	3·2	3·3	24·3
Electrical engineering	232·8	341·7	3·3	4·0	46·8
Vehicles less aircraft	94·1	74·2	1·3	0·9	−21·1
Aircraft	29·5	35·9	0·4	0·4	21·7
Metal goods not elsewhere specified	178·8	187·6	2·6	2·2	4·9
Textiles	524·9	346·6	7·5	4·1	−34·0
Leather, clothing and footwear	461·8	387·8	6·8	4·8	−16·0
Bricks, pottery, glass, cement, etc.	84·9	74·4	1·2	0·9	−12·4
Timber, furnitura, atc.	57·0	53·2	0·8	0·7	2·1
Paper	73·6	83·1	1·1	1·0	13·1
Printing and publishing	115·7	130·0	1·7	1·5	12·4
Other manufacturing industries	102·5	132·6	1·5	1·6	29·4
Construction	44·5	91·8	0·6	1·1	105·8
Services	4,073·0	5,625·3	58·3	66·2	38·1
Gas, electricity and water	37·7	57·4	0·5	0·7	52·3
Railweys	39·3	22·7	0·6	0·3	−43·0
Road transport	63·7	62·4	1·0	0·7	— 9·2
Transport (othar)	138·3	185·1	2·0	2·2	33·8
Retail distribution	842·6	1,277·4	12·1	15·0	51·8
Distribution less retail	218·3	273·0	3·1	3·2	25·1
Insurance, banking, finance, profassional and sclantific sarvices lass education, madical and dantal	308·1	489·3	4·4	5·8	58·8
Miscellaneous services, less catering and motor repeirers	664·2	728·1	9·9	8·6	4·9
Cataring, hotals, etc.	488·5	371·1	7·0	4·4	−24·0
Motor repairers	32·7	89·2	0·5	1·1	172·8
Education	397·4	900·3	6·7	10·8	126·5
Medicel and dental	432·6	733·4	6·2	8·6	69·5
Govarnment: national	181·1	211·0	2·3	2·5	16·5
Government: local	193·0	224·9	2·8	2·6	16·5

* Figures may not add to totals due to roundings.

Source: Department of Employment and Productivity.

Study Area—total: employees in employment 1952-68* TABLE 7A.4

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential†
Total	**545·2**	**623·0**	**100·8**	**100·0**	**14·3**	**4·1**
Primary	30·6	17·2	5·6	2·8	−43·8	1·0
Agriculture, forestry and fishing	17·4	12·1	3·2	1·9	−30·5	14·8
Coal-mining	10·4	2·6	1·9	0·4	−75·0	−28·8
Mining and quarrying (other)	2·9	2·5	0·5	0·4	−13·8	12·4
Manufacturing	220·3	252·8	40·4	40·6	14·8	11·0
Food, drink and tobacco	33·4	35·8	6·1	5·7	7·2	8·2
Chemicals and allied industries	13·7	10·6	2·5	1·7	−22·8	−24·0
Iron and steel, tubes, castings, etc.	12·9	18·3	2·4	2·9	41·9	45·3
Light metals, copper, brass, etc.	8·7	6·1	1·6	1·0	−29·9	−17·8
Shipbuilding and mechanical engineering	35·2	51·4	6·5	8·3	46·0	38·5
Electrical engineering	8·9	12·6	1·8	2·0	41·8	− 3·6
Vehicles less aircraft	13·6	10·7	2·5	1·7	−21·3	−12·7
Aircraft	29·2	31·8	5·4	5·1	8·9	−17·0
Metal goods not elsewhere specified	5·1	9·2	0·9	1·5	80·4	63·5
Textiles	8·0	10·2	1·5	1·6	27·5	52·1
Leather, clothing and footwear	9·6	9·3	1·8	1·5	− 3·1	15·3
Bricks, pottery, glass, cement, etc.	5·1	5·1	0·9	0·8	0·0	0·1
Timber, furniture, etc.	9·4	8·6	1·7	1·4	− 8·5	−11·5
Paper	8·0	12·9	1·5	2·1	61·3	30·2
Printing and publishing	14·3	14·1	2·6	2·3	− 1·4	−18·9
Other manufacturing industries	5·1	6·1	0·9	1·0	19·6	−16·1
Construction	36·1	42·4	6·6	6·8	17·5	− 1·8
Services	258·1	310·5	47·3	49·8	20·3	− 3·5
Gas, electricity and water	12·2	16·6	2·2	2·7	36·1	25·7
Railways	19·8	8·9	3·6	1·4	−55·1	− 9·7
Road transport	13·5	14·5	2·5	2·3	7·4	8·9
Transport (other)	13·6	11·4	2·5	1·8	−16·2	−35·7
Retail distribution	36·1	49·8	6·6	8·0	37·4	3·2
Distribution less retail	19·7	19·6	3·6	3·1	− 0·5	−17·1
Insurance, banking, finance, professional and scientific services less education, medical and dental	15·0	23·6	2·8	3·8	57·3	10·0
Miscellaneous services, less catering and motor repairers	26·6	28·3	4·9	4·6	6·8	− 7·9
Catering, hotels, etc.	19·3	14·0	3·5	2·2	−27·5	−13·8
Motor repairers	9·6	13·7	1·8	2·2	42·7	−19·5
Education	20·1	45·3	3·7	7·3	125·4	8·7
Medical and dental	20·2	35·2	3·7	5·6	74·3	13·3
Government: national	12·2	7·1	2·2	1·1	−41·8	−37·3
Government: local	20·1	22·8	3·7	3·7	13·4	1·5

* Figures may not add to totals due to roundings.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952-68 from the corresponding local percentage change.

Source: Department of Employment and Productivity.

Study Area—males: employees in employment 1952-68* TABLE 7A.5

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential†
Total	368·3	399·3	100·0	100·0	8·4	4·2
Primary	28·2	14·5	7·7	3·6	−48·6	− 1·7
Agriculture, forestry and fishing	15·3	9·7	4·2	2·4	−36·6	12·1
Coal-mining	10·2	2·5	2·8	0·6	−75·5	−28·3
Mining and quarrying (other)	2·7	2·2	0·7	0·6	−18·5	10·2
Manufacturing	160·5	190·0	43·8	47·8	18·4	11·5
Food, drink and tobacco	18·5	20·5	5·0	5·1	10·8	12·6
Chemicals and allied industries	9·9	8·6	2·7	2·2	−13·1	−15·9
Iron and steel, tubes, castings, etc.	11·6	16·9	3·2	4·2	43·2	46·1
Light metals, copper, brass, etc.	7·6	5·5	2·1	1·4	−27·6	−19·1
Shipbuilding and mechanical engineering	29·0	42·3	7·9	10·6	45·9	39·3
Electrical engineering	5·6	8·3	1·5	2·1	48·2	3·9
Vehicles less aircraft	11·6	9·1	3·2	2·3	−22·9	−18·5
Aircraft	25·3	28·5	6·9	7·1	12·6	−14·1
Metal goods not elsewhere specified	3·1	6·2	0·8	1·6	100·0	76·1
Textiles	4·9	7·6	1·3	1·9	55·1	67·0
Leather, clothing and footwear	3·4	3·3	0·9	0·8	− 2·9	20·9
Bricks, pottery, glass, cement, etc.	4·3	4·4	1·2	1·1	2·3	− 1·8
Timber, furniture, etc.	7·9	7·0	2·1	1·6	−11·4	−14·6
Paper	5·0	9·1	1·4	2·3	82·0	37·7
Printing and publishing	6·8	9·4	2·4	2·4	6·8	−13·4
Other manufacturing industries	3·4	3·2	0·9	0·8	− 5·9	−46·0
Construction	35·1	40·1	9·5	10·0	14·2	− 2·0
Services	144·5	154·8	39·2	38·8	7·1	− 5·9
Gas, electricity and water	10·6	14·2	2·9	3·8	31·5	25·8
Railways	19·0	8·3	5·2	2·1	−56·3	−10·7
Road transport	11·7	12·8	3·2	3·2	9·4	7·3
Transport (other)	11·3	8·5	3·1	2·1	−24·6	−41·1
Retail distribution	14·7	17·2	4·0	4·3	17·0	6·0
Distribution less retail	13·9	13·2	3·8	3·3	− 5·0	−17·7
Insurance, banking, finance, professional and scientific services less education, medical and dental	8·9	12·3	2·4	3·1	38·2	− 0·9
Miscellaneous services, less catering and motor repairers	6·3	8·0	1·7	2·0	27·0	−12·5
Catering, hotels, etc.	3·9	4·0	1·1	1·0	2·6	−12·3
Motor repairers	8·4	11·0	2·3	2·8	31·0	−15·2
Education	7·2	14·6	2·0	3·7	102·8	5·0
Medical and dental	5·8	8·1	1·6	2·0	39·7	0·8
Government: national	7·1	4·8	1·9	1·2	−32·4	−19·1
Government: local	15·4	17·8	4·2	4·5	15·6	5·3

* Figures may not add to totals due to roundings.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952-68 from the corresponding local percentage change.

Source: Department of Employment and Productivity.

Study Area—females: employees in employment 1952-68* TABLE 7A.6

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential†
Total	**176·6**	**223·7**	**100·0**	**100·0**	**26·5**	**4·8**
Primary	2·4	2·7	1·4	1·2	12·5	30·5
Agriculture, forestry and fishing	2·1	2·4	1·2	1·1	14·3	37·6
Coal-mining	0·2	0·1	0·1	0·0	−50·0	−57·7
Mining and quarrying (other)	0·2	0·2	0·1	0·1	0·0	−17·8
Manufacturing	59·8	62·9	33·8	28·1	5·2	7·5
Food, drink and tobacco	14·9	15·2	8·4	6·8	2·0	2·0
Chemicals and allied industries	3·8	2·0	2·1	0·9	−47·4	−45·2
Iron and steel, tubes, castings, etc.	1·1	1·5	0·6	0·7	36·4	43·7
Light metals, copper, brass, etc.	1·2	0·5	0·7	0·2	−58·3	−33·9
Shipbuilding and mechanical engineering	6·2	9·1	3·5	4·1	46·8	22·5
Electrical engineering	3·8	4·4	1·9	2·0	33·3	−13·5
Vehicles less aircraft	1·8	1·8	1·0	0·7	−11·1	10·0
Aircraft	3·8	3·3	2·1	1·5	−13·2	−34·9
Metal goods not elsewhere specified	1·9	2·9	1·1	1·3	52·6	47·7
Textiles	3·1	2·6	1·8	1·2	−16·1	17·9
Leather, clothing and footwear	6·3	6·0	3·6	2·7	− 4·8	11·2
Bricks, pottery, glass, cement, etc.	0·7	0·7	0·4	0·3	0·0	−12·4
Timber, furniture, etc.	1·6	1·8	0·8	0·7	6·7	4·6
Paper	3·0	3·8	1·7	1·7	26·7	13·6
Printing and publishing	6·5	4·8	3·1	2·1	−12·7	−25·1
Other manufacturing industries	1·7	2·9	1·0	1·3	70·6	41·2
Construction	1·0	2·3	0·6	1·0	130·0	24·2
Services	113·6	155·8	64·2	69·6	37·1	− 1·0
Gas, electricity and water	1·4	2·5	0·8	1·1	78·6	26·3
Railways	0·8	0·8	0·6	0·3	−25·0	18·0
Road transport	1·8	1·7	1·0	0·8	− 5·6	3·6
Transport (other)	2·3	2·9	1·3	1·3	26·1	− 7·7
Retail distribution	21·4	32·3	12·1	14·4	50·9	− 0·7
Distribution less retail	5·8	6·4	3·3	2·9	10·3	−14·8
Insurance, banking, finance, professional and scientific services less education, medical and dental	6·1	11·2	3·4	5·0	83·6	24·8
Miscellaneous services, less catering and motor repairers	20·2	20·3	11·4	9·1	0·5	− 4·4
Catering, hotels, etc.	15·4	10·0	8·7	4·5	−35·1	−11·1
Motor repairers	1·2	2·7	0·7	1·2	125·0	−47·8
Education	13·0	30·6	7·3	13·7	135·4	8·9
Medical and dental	14·4	27·1	8·1	12·1	88·2	18·7
Government: national	5·1	2·3	2·9	1·0	−54·9	−71·4
Government: local	4·7	8·1	2·7	2·3	8·5	− 8·0

* Figures may not add to totals due to roundings.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952-68 from the corresponding local percentage change.

Source: Department of Employment and Productivity.

Bristol-Bath—total: employees in employment 1952-68*

TABLE 7A.7

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential†
Total	**292·9**	**339·5**	**100·8**	**100·0**	**15·9**	**5·7**
Primary	10·5	5·9	3·6	1·7	−43·8	1·0
Agriculture, forestry and fishing	5·3	3·7	1·8	1·1	−30·2	−15·1
Coal-mining	3·4	8·9	1·2	0·3	−73·5	−27·3
Mining and quarrying (other)	1·8	1·2	0·6	0·4	−33·3	− 7·1
Manufacturing	117·8	129·7	40·2	38·2	10·1	6·3
Food, drink and tobacco	24·0	25·8	8·2	7·6	7·5	8·5
Chemicals and allied industries	5·6	4·3	1·9	1·3	−23·2	−24·6
Iron and steel, tubes, castings, etc.	0·8	0·5	0·2	0·1	−16·7	−13·3
Light metals, copper, brass, etc.	3·1	2·8	1·1	0·8	−16·1	− 4·0
Shipbuilding and mechanical engineering	17·5	17·3	6·0	5·1	− 1·1	−10·6
Electrical engineering	3·3	8·1	1·1	1·8	84·8	39·6
Vehicles less aircraft	6·8	4·8	2·3	1·2	−39·4	−30·8
Aircraft	18·1	25·9	5·5	7·6	60·9	35·0
Metal goods not elsewhere specified	2·0	4·2	0·7	1·2	110·0	93·1
Textiles	1·7	1·4	0·6	0·4	−17·6	7·0
Leather, clothing and footwear	7·4	7·4	2·5	2·2	0·8	−18·4
Bricks, pottery, glass, cement, etc.	2·8	2·4	1·0	0·7	−14·3	−14·2
Timber, furniture, etc.	5·6	4·7	1·9	1·4	−16·1	−19·1
Paper	6·9	10·1	2·4	3·0	46·4	15·3
Printing and publishing	11·9	11·2	4·1	3·3	− 5·9	−23·4
Other manufacturing industries	2·7	2·0	0·9	0·6	−25·9	−61·6
Construction	18·7	25·1	6·4	7·4	34·2	14·9
Services	146·0	178·7	49·8	52·6	22·4	− 1·4
Gas, electricity and water	7·1	9·7	2·4	2·9	36·6	26·2
Railways	9·2	5·4	3·1	1·6	−41·3	4·1
Road transport	7·9	8·1	2·7	2·4	2·5	2·0
Transport (other)	9·8	7·6	3·1	2·2	−15·6	−35·1
Retail distribution	20·1	28·9	6·9	8·5	43·8	9·6
Distribution less retail	13·9	14·0	4·7	4·1	0·7	−15·9
Insurance, banking, finance, professional and scientific services less education, medical and dental	9·9	14·7	3·4	4·3	48·5	1·2
Miscellaneous services, less catering and motor repairers	14·4	17·8	4·9	5·2	23·6	3·9
Catering, hotels, etc.	9·5	7·9	3·2	2·3	−18·8	− 3·1
Motor repairers	6·6	7·6	2·3	2·2	15·2	−47·0
Education	9·8	24·1	3·3	7·1	145·9	29·2
Medical and dental	12·4	21·1	4·2	6·2	70·2	9·2
Government: national	8·2	1·9	2·1	0·8	−69·4	−64·9
Government: local	10·1	9·7	3·4	2·9	− 4·0	−15·9

* Figures may not add to totals due to roundings.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952-68 from the corresponding local percentage change.

Source: Department of Employment and Productivity.

Bristol-Bath—males: employees in employment 1952-68* TABLE 7A.8

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential†
Total	**194·9**	**214·6**	**100·0**	**100·0**	**10·1**	**5·9**
Primary	9·5	4·8	4·9	2·2	−51·8	− 4·9
Agriculture, forestry and fishing	4·6	2·8	2·4	1·2	−42·9	5·8
Coal-mining	3·3	0·9	1·7	0·4	−72·8	−25·6
Mining and quarrying (other)	1·6	1·1	0·8	0·5	−34·0	− 5·3
Manufacturing	84·0	95·8	43·1	44·7	14·2	7·3
Food, drink and tobacco	13·3	14·7	6·8	6·8	10·5	12·3
Chemicals and allied industries	4·1	3·5	2·1	1·7	−12·1	−14·9
Iron and steel, tubes, castings, etc.	0·5	0·5	0·3	0·2	− 0·2	2·7
Light metals, copper, brass, etc.	2·8	2·4	1·4	1·1	−14·3	− 5·8
Shipbuilding and mechanical engineering	15·3	15·1	7·8	7·0	− 1·2	− 7·8
Electrical engineering	2·2	4·2	1·1	1·9	87·6	43·3
Vehicles less aircraft	5·8	3·5	3·0	1·8	−40·6	−34·2
Aircraft	14·0	23·5	7·2	11·0	67·9	41·2
Metal goods not elsewhere specified	1·4	3·2	0·7	1·5	135·4	111·5
Textiles	0·9	0·9	0·5	0·4	− 7·4	4·5
Leather, clothing and footwear	2·9	2·9	1·5	1·4	0·7	24·5
Bricks, pottery, glass, cement, etc.	2·3	1·9	1·2	0·9	−15·7	−19·8
Timber, furniture, etc.	4·7	3·9	2·4	1·8	−18·5	−21·7
Paper	4·4	7·0	2·2	3·3	61·6	17·3
Printing and publishing	7·3	7·4	3·8	3·4	1·0	−19·2
Other manufacturing industries	2·1	1·2	1·1	0·5	−41·0	−81·1
Construction	18·1	23·7	9·3	11·0	30·6	14·4
Services	83·2	90·4	42·7	42·1	8·7	− 4·3
Gas, electricity and water	6·2	7·9	3·2	3·7	27·3	21·5
Railways	8·7	4·9	4·5	2·3	−43·9	1·7
Road transport	7·0	7·3	3·6	3·4	4·9	2·8
Transport (other)	7·6	5·8	3·9	2·7	−23·7	−40·0
Retail distribution	8·1	10·2	4·1	4·8	26·5	15·5
Distribution less retail	9·9	9·3	5·1	4·4	− 5·8	−18·3
Insurance, banking, finance, professional and scientific services less education, medical and dental	5·6	7·8	3·0	3·6	33·6	− 5·5
Miscellaneous services, less catering and motor repairers	3·8	5·6	1·9	2·8	50·8	11·1
Catering, hotels, etc.	2·1	2·5	1·1	1·2	17·5	2·6
Motor repairers	5·9	5·3	3·0	2·9	8·0	−38·2
Education	3·4	8·7	1·8	4·0	152·3	54·5
Medical and dental	3·6	5·1	1·9	2·4	36·7	− 2·2
Government: national	3·1	1·4	1·5	0·6	−56·0	−42·7
Government: local	7·8	7·5	4·0	3·5	− 3·9	−14·2

* Figures may not add to totals due to roundings.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952-68 from the corresponding local percentage change.

Source: Department of Employment and Productivity.

Bristol-Bath—females: employees in employment 1952-68*

TABLE 7A.9

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential†
Total	**98·0**	**124·9**	**100·0**	**100·0**	**27·4**	**5·7**
Primary	0·8	1·3	0·9	1·0	53·7	71·7
Agriculture, forestry and fishing	0·7	1·1	0·7	0·9	58·9	82·2
Coal-mining	0·0	0·0	0·0	0·0	89·5	81·6
Mining and quarrying (other)	0·1	0·1	0·1	0·1	13·8	− 4·0
Manufacturing	33·8	33·9	34·5	27·1	0·1	2·4
Food, drink and tobacco	10·8	11·1	11·0	8·9	3·3	3·3
Chemicals and allied industries	1·5	0·7	1·5	0·5	−54·5	−52·3
Iron and steel, tubes, castings, etc.	0·0	0·0	0·0	0·0	−55·1	−47·8
Light metals, copper, brass, etc.	0·3	0·2	0·3	0·2	−26·3	− 1·9
Shipbuilding and mechanical engineering	2·2	2·2	2·2	1·8	0·9	−25·4
Electrical engineering	1·1	1·9	1·1	1·5	71·8	25·0
Vehicles less aircraft	0·8	0·5	0·8	0·4	−35·7	−14·6
Aircraft	2·1	2·4	2·1	1·9	14·1	− 7·6
Metal goods not elsewhere specified	0·8	1·0	0·6	0·8	67·9	63·0
Textiles	0·8	0·5	0·8	0·4	−33·8	0·2
Leather, clothing and footwear	4·5	4·5	4·6	3·6	− 0·2	15·8
Bricks, pottery, glass, cament, etc.	0·5	0·5	0·5	0·4	− 9·2	3·2
Timber, furniture, etc.	0·9	0·8	0·9	0·7	− 5·3	− 7·4
Paper	2·6	3·0	2·6	2·4	17·7	4·6
Printing and publishing	4·6	3·8	4·7	3·0	−18·5	−30·9
Other manufacturing industries	0·8	0·7	0·8	0·6	26·2	− 3·2
Construction	0·5	1·4	0·5	1·2	172·8	66·8
Services	62·8	88·3	64·1	70·7	40·6	2·5
Gas, electricity and water	0·9	1·8	0·9	1·4	180·4	56·1
Railways	0·4	0·5	0·4	0·4	28·2	71·2
Road transport	0·9	0·8	0·9	0·6	− 5·3	0·9
Transport (other)	1·4	1·8	1·4	1·4	25·2	− 8·6
Retail distribution	12·1	18·7	12·3	14·9	54·7	3·1
Distribution less retail	4·0	4·7	4·1	3·7	15·4	− 9·7
Insurance, banking, finance, professional and scientific services less education, medical and dental	4·0	7·0	4·1	5·6	71·7	12·9
Miscellaneous services, less catering and motor repairers	10·7	12·2	10·9	9·7	14·2	9·3
Catering, hotels, etc.	7·3	5·4	7·4	4·3	−26·0	− 2·0
Motor repairers	0·8	1·3	0·8	1·1	71·1	−101·7
Education	6·4	15·5	6·5	12·4	142·6	18·3
Medical and dental	8·7	16·0	8·9	12·8	84·8	15·1
Government: national	3·1	0·6	3·2	0·4	−81·1	−97·6
Government: local	2·2	2·2	2·2	1·8	− 2·1	−18·6

* Figures may not add to totals due to roundings. Numbers of employees in employment less than 50 are shown as 0·0.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952-68 from the corresponding local percentage change.

Source: Department of Employment and Productivity.

North Gloucestershire—total: employees in employment 1952-68*

TABLE 7A.10

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential†
Total	**146·8**	**167·8**	**100·0**	**100·0**	**14·3**	**4·1**
Primary	13·4	7·3	9·1	4·4	−45·5	− 0·7
Agriculture, forestry and fishing	8·9	6·3	6·1	3·8	−29·2	16·1
Coal-mining	3·8	0·0	2·6	0·0	−99·0	−52·8
Mining and quarrying (other)	0·7	0·9	0·5	0·5	28·6	54·8
Manufacturing	55·5	69·4	37·8	41·4	25·0	21·2
Food, drink and tobacco	5·8	6·6	4·0	3·9	13·8	14·8
Chemicals and allied industries	1·6	2·5	1·1	1·5	56·3	54·9
Iron and steel, tubes, castings, etc.	1·2	1·1	0·8	0·7	− 8·3	− 4·9
Light metals, copper, brass, etc.	1·4	0·2	1·0	0·1	−85·7	−73·6
Shipbuilding and mechenicel engineering	13·9	27·9	9·5	16·6	100·7	91·2
Electrical engineering	1·6	2·8	1·1	1·7	75·0	29·8
Vehicles less aircraft	3·2	2·2	2·2	1·3	−31·2	−22·6
Aircraft	13·0	5·9	8·9	3·5	−54·6	−80·5
Metel goods not elsewhere specified	1·3	2·8	0·9	1·7	115·4	98·5
Textiles	2·6	4·5	1·8	2·7	73·1	97·7
Leather, clothing and footwear	1·2	0·9	0·8	0·5	−25·0	− 6·6
Bricks, pottery, glass, cement, etc.	1·1	1·4	0·7	0·8	27·3	27·4
Timber, furniture, etc.	3·1	3·3	2·1	2·0	8·5	3·5
Paper	0·9	1·8	0·6	1·1	100·0	68·9
Printing end publishing	1·7	2·4	1·2	1·4	41·2	23·7
Other manufacturing industries	1·9	3·2	1·3	1·9	68·4	32·7
Construction	11·3	10·8	7·7	6·4	− 4·4	−23·7
Services	66·7	80·2	45·4	47·8	20·2	− 3·6
Gas, electricity end water	2·9	3·8	2·0	2·1	24·1	13·7
Railways	4·0	1·4	2·7	0·8	−65·0	−19·6
Road trensport	3·2	3·4	2·2	2·0	8·3	5·8
Transport (other)	1·9	1·5	1·3	0·9	−21·1	−40·6
Rstail distribution	10·3	12·8	7·0	7·6	24·3	− 9·9
Distribution less retail	3·3	3·1	2·2	1·8	− 6·1	−22·7
Insurance, banking, finance, professional and scientific services less education, medical and dental	3·3	5·9	2·2	3·5	78·8	31·5
Miscellaneous services, less catering and motor repaires	8·7	6·2	5·9	3·7	−28·7	−43·4
Cetering, hotels, etc.	6·6	3·8	4·4	2·3	−41·8	−27·8
Motor repairers	2·0	3·9	1·4	2·3	95·0	32·8
Education	6·1	14·2	4·2	8·5	132·8	16·1
Medical and dental	4·3	7·6	2·9	4·5	76·7	15·7
Government: netional	5·1	4·5	3·5	2·7	−11·8	− 7·3
Government: local	4·9	8·5	3·3	5·1	73·5	61·8

* Figures may not add to totals due to roundings. Numbers of employees in employment less than 50 are shown as 0·0.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952-68 from the corresponding local percentage change.

Source. Department of Employment and Productivity.

North Gloucestershire—males: employees in employment 1952-68*

TABLE 7A.11

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential†
Total	**98·6**	**107·3**	**100·0**	**100·0**	**8·8**	**4·6**
Primary	12·2	6·2	12·3	5·8	−49·1	− 2·2
Agriculture, forestry and fishing	7·9	5·3	8·0	5·0	−32·7	16·0
Coal-mining	3·6	0·0	3·7	0·0	−99·1	−51·9
Mining and quarrying (other)	0·7	0·8	0·7	0·8	28·0	56·7
Manufacturing	40·8	52·1	41·4	48·6	27·5	20·6
Food, drink and tobacco	3·5	4·5	3·5	4·2	27·7	29·5
Chemicals and allied industries	1·0	1·9	1·1	1·8	79·9	77·1
Iron and steel, tubes, castings, etc.	1·1	0·9	1·2	0·8	−19·2	−16·3
Light metals, copper, brass, etc.	1·0	0·2	1·0	0·2	−83·7	−75·2
Shipbuilding and mechanical engineering	10·8	22·4	10·8	20·9	110·3	103·7
Electrical engineering	1·2	1·9	1·2	1·8	58·0	13·7
Vehicles less aircraft	2·8	1·9	2·8	1·8	−31·4	−25·0
Aircraft	11·3	4·9	11·4	4·6	−56·2	−82·9
Metal goods not elsewhere specified	0·7	1·8	0·7	1·7	146·4	122·5
Textiles	1·1	3·1	1·1	2·9	197·1	209·0
Leather, clothing and footwear	0·3	0·3	0·3	0·3	0·7	24·5
Bricks, pottery, glass, cement, etc.	1·0	1·3	1·0	1·2	30·2	26·1
Timber, furniture, etc.	2·4	2·6	2·5	2·4	6·9	3·7
Paper	0·6	1·2	0·6	1·1	119·8	75·5
Printing and publishing	1·0	1·6	1·1	1·5	50·0	29·8
Other manufacturing industries	1·1	1·5	1·1	1·4	38·7	− 1·4
Construction	11·0	10·3	11·1	9·6	− 6·5	−22·7
Services	34·6	38·8	35·1	36·2	12·0	− 1·0
Gas, electricity and water	2·6	3·2	2·7	3·0	20·0	14·3
Railways	3·8	1·3	3·9	1·2	−65·6	−20·0
Road transport	2·8	3·0	2·8	2·8	6·5	4·4
Transport (other)	1·4	0·9	1·4	0·8	−33·2	−49·5
Retail distribution	4·6	4·9	4·6	4·6	7·7	− 3·3
Distribution less retail	2·4	1·9	2·5	1·8	−21·3	−34·0
Insurance, banking, finance, professional and scientific services less education, medical and dental	2·0	3·1	2·0	2·9	52·8	13·7
Miscellaneous services, less catering and motor repairers	1·7	1·4	1·7	1·3	−19·9	−59·4
Catering, hotels, etc.	1·3	1·0	1·3	0·9	−25·0	−39·9
Motor repairers	1·7	3·0	1·7	2·8	76·9	30·7
Education	2·1	4·0	2·1	3·7	92·1	− 5·7
Medical and dental	0·9	1·4	1·0	1·3	53·3	14·4
Government: national	3·3	3·1	3·3	2·9	− 7·0	6·3
Government: local	4·0	6·6	4·0	6·2	67·5	57·2

* Figures may not add to totals due to roundings. Numbers of employees in employment less than 50 are shown as 0·0.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952–68 from the corresponding local percentage change.

Source: Department of Employment and Productivity.

North Gloucestershire—females: employees in employment 1952-68*

TABLE 7A.12

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential†
Total	**48·2**	**60·5**	**100·0**	**100·0**	**25·4**	**3·7**
Primary	1·2	1·1	2·5	1·8	− 7·4	30·6
Agriculture, forestry and fishing	1·0	1·0	2·1	1·7	0·4	23·7
Coal-mining	0·2	0·0	0·3	0·0	−97·5	−105·2
Mining and quarrying (other)	0·0	0·1	0·0	0·1	366·7	348·9
Manufacturing	14·7	17·4	30·4	28·7	18·4	20·7
Food, drink and tobacco	2·3	2·1	4·8	3·5	− 7·0	− 7·0
Chemicals and allied industries	0·6	0·7	1·1	1·1	17·9	20·1
Iron and steel, tubes, castings, etc.	0·1	0·1	0·1	0·2	84·7	92·0
Light metals, copper, brass, etc.	0·4	0·0	0·8	0·1	−90·3	65·9
Shipbuilding and mechanical engineering	3·2	5·5	6·7	9·2	71·6	47·3
Electrical engineering	0·4	0·9	0·8	1·5	133·5	86·7
Vehicles less aircraft	0·4	0·2	0·9	0·4	−42·3	−21·2
Aircraft	1·8	1·0	3·7	1·6	−46·4	−68·1
Metal goods not elsewhere specified	0·8	1·0	1·3	1·7	65·8	60·9
Textiles	1·5	1·3	3·2	2·2	−13·3	20·7
Leather, clothing and footwear	0·9	0·6	1·9	1·1	−29·7	−13·7
Bricks, pottery, glass, cement, etc.	0·1	0·1	0·2	0·1	1·2	13·8
Timber, furniture, etc.	0·6	0·7	1·3	1·1	8·3	6·2
Paper	0·4	0·5	0·7	0·9	48·0	34·9
Printing and publishing	0·6	0·8	1·3	1·3	25·8	13·4
Other manufacturing industries	0·8	1·7	1·6	2·7	117·2	87·8
Construction	0·3	0·8	0·6	1·0	94·1	−11·7
Services	32·0	41·4	66·5	68·5	29·2	− 8·9
Gas, electricity and water	0·3	0·4	0·6	0·6	31·0	−21·3
Railways	0·2	0·0	0·3	0·1	−71·3	−28·3
Road transport	0·4	0·5	0·9	0·8	13·3	22·5
Transport (other)	0·6	0·6	1·2	1·0	7·9	−25·9
Retail distribution	5·7	7·9	11·8	13·1	38·1	−13·5
Distribution less retail	0·9	1·1	1·9	1·9	24·5	− 0·6
Insurance, banking, finance, professional and scientific services less education, medical and dental	1·3	2·8	2·7	4·6	111·2	52·4
Miscellaneous services, less catering and motor repairers	7·0	4·8	14·8	8·0	−31·7	−36·6
Catering, hotels, etc.	5·2	2·8	10·7	4·6	−45·6	−21·5
Motor repairers	0·3	0·8	0·8	1·4	176·6	3·8
Education	4·0	10·2	8·4	16·8	161·4	24·9
Medical and dental	3·4	6·1	7·0	10·2	82·2	12·7
Government: national	1·8	1·5	3·7	2·4	−18·0	−34·5
Government: local	1·0	1·9	2·1	3·1	89·5	73·0

* Figures may not add to totals due to roundings. Numbers of employees in employment less than 50 are shown as 0·0.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952-68 from the corresponding local percentage change.

Source: Department of Employment and Productivity.

Monmouthshire-Ross—total: employees in employment 1952-68*

TABLE 7A.13

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential†
Total	**105·5**	**115·7**	**100·0**	**100·0**	**9·7**	**— 0·5**
Primary	6·8	4·0	6·4	3·5	—41·2	3·6
Agriculture, forestry and fishing	3·1	2·0	2·9	1·7	—35·5	9·8
Coal-mining	3·3	1·8	3·1	1·4	—51·5	— 5·3
Mining and quarrying (other)	0·4	0·3	0·4	0·3	—25·0	1·2
Manufacturing	47·1	53·7	44·8	46·4	14·0	10·2
Food, drink and tobacco	3·6	3·4	3·4	2·9	— 5·6	— 4·6
Chemicals and allied industries	8·5	3·8	6·2	3·3	—41·5	—42·9
Iron and steel, tubes, castings, etc.	11·1	16·8	10·5	14·5	51·4	54·6
Light metals, copper, brass, etc.	4·3	3·2	4·1	2·8	—25·6	—13·5
Shipbuilding and mechanical engineering	3·8	6·1	3·8	5·3	60·5	51·0
Electrical engineering	4·0	3·7	3·8	3·2	— 7·5	—52·7
Vehicles	3·8	4·6	3·6	4·0	21·1	21·5
Metal goods not elsewhere specified	1·8	2·2	1·7	1·9	22·2	5·3
Textiles	3·7	4·3	3·5	3·7	16·2	40·3
Leather, clothing and footwear	1·1	1·0	1·0	0·9	— 9·1	9·3
Bricks, pottery, glass, cement, etc.	1·2	1·4	1·1	1·2	16·7	16·8
Timber, furniture, etc.	0·8	0·6	0·8	0·5	—25·0	—28·0
Paper	0·2	1·1	0·2	1·0	450·0	418·9
Printing and publishing	0·7	0·6	0·7	0·5	—14·3	—31·8
Other manufacturing industries	0·6	0·9	0·6	0·8	50·0	14·3
Construction	6·2	6·4	5·9	5·5	3·2	—16·1
Services	45·4	51·6	43·0	44·6	13·7	—10·1
Gas, electricity and water	2·2	3·4	2·1	2·9	54·5	44·1
Railways	5·6	2·1	5·3	1·8	—56·2	—22·8
Road transport	2·4	2·9	2·3	2·5	20·8	20·3
Transport (other)	2·6	2·3	2·5	2·0	—11·5	—31·0
Retail distribution	5·7	7·9	5·4	6·8	38·6	4·4
Distribution less retail	2·4	2·5	2·3	2·2	4·2	—12·4
Insurance, banking, finance, professional and scientific services less education, medical and dental	1·8	3·0	1·7	2·6	66·7	19·4
Miscellaneous services, less catering and motor repairers	3·4	4·3	3·2	3·7	26·5	11·8
Catering, hotels, etc.	3·4	2·3	3·2	2·0	—32·4	—16·7
Motor repairers	1·0	2·2	0·9	1·9	120·0	57·8
Education	4·2	6·9	4·0	6·0	64·3	—52·4
Medical and dental	3·5	6·5	3·3	5·6	85·7	24·7
Government: national	0·9	0·6	0·9	0·5	—33·3	—28·8
Government: local	5·2	4·7	4·9	4·1	— 9·6	—21·5

* Figures may not add to totals due to roundings.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952-68 from the corresponding local percentage change.

Source: Department of Employment and Productivity.

Monmouthshire-Ross—males: employees in employment 1952-68*

TABLE 7A.14

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential†
Total	**74·8**	**77·4**	**100·0**	**100·0**	**3·4**	**− 0·8**
Primary	6·4	3·6	8·5	4·7	−43·0	3·9
Agriculture, forestry and fishing	2·8	1·7	3·7	2·3	−36·8	12·1
Coal-mining	3·3	1·6	4·3	2·1	−50·6	− 3·4
Mining and quarrying (other)	0·4	0·3	0·5	0·4	−25·1	3·6
Manufacturing	35·7	42·0	47·7	54·3	17·6	10·7
Food, drink and tobacco	1·8	1·4	2·4	1·8	−20·8	−18·8
Chemicals and allied industries	4·8	3·1	6·4	4·0	−35·8	−38·0
Iron and steel, tubes, castings, etc.	10·2	15·4	13·6	20·0	51·8	54·7
Light metals, copper, brass, etc.	3·8	3·0	5·1	3·9	−21·5	−13·0
Shipbuilding and mechanical engineering	3·1	4·8	4·1	6·2	57·0	50·4
Electrical engineering	2·2	2·2	3·0	2·8	− 1·2	−45·5
Vehicles	3·2	3·8	4·3	4·9	17·8	16·3
Metal goods not elsewhere specified	1·1	1·2	1·4	1·6	18·8	− 5·3
Textiles	2·9	3·6	3·9	4·7	23·8	35·2
Leather, clothing and footwear	0·2	0·1	0·3	0·2	−24·3	− 0·5
Bricks, pottery, glass, cement, etc.	1·0	1·2	1·4	1·6	18·2	12·1
Timber, furniture, etc.	0·7	0·5	1·0	0·7	−27·5	−30·7
Paper	0·1	0·8	0·2	1·0	588·7	542·4
Printing and publishing	0·5	0·4	0·6	0·5	−13·2	−33·4
Other manufacturing industries	0·2	0·4	0·2	0·5	147·9	107·8
Construction	6·0	6·1	8·0	7·9	2·0	−14·2
Services	26·7	25·8	35·7	33·0	− 4·1	−17·1
Gas, electricity and water	2·0	3·1	2·7	4·0	54·5	48·8
Railways	6·4	2·1	8·6	2·7	−67·8	−22·2
Road transport	2·0	2·5	2·6	3·3	27·6	25·5
Transport (other)	2·3	1·7	3·0	2·3	−23·3	−39·6
Retail distribution	2·1	2·1	2·8	2·7	1·1	− 9·9
Distribution less retail	1·6	1·9	2·1	2·5	20·2	7·5
Insurance, banking, finance, professional and scientific services less education, medical and dental	1·1	1·5	1·5	1·9	34·8	− 4·5
Miscellaneous services, less catering and motor repairers	0·8	1·0	1·1	1·2	17·6	−21·9
Catering, hotels, etc.	0·5	0·5	0·6	0·7	11·1	− 3·8
Motor repairers	0·9	1·7	1·1	2·2	98·0	51·8
Education	1·6	1·9	2·2	2·5	18·0	−79·8
Medical and dental	1·1	1·5	1·5	2·0	37·8	− 1·6
Government: national	0·7	0·4	0·9	0·5	−47·2	−33·9
Government: local	3·7	3·7	4·9	4·7	0·8	−10·0

* Figures may not add to totals due to roundings.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952-68 from the corresponding local percentage change.

Source. Department of Employment and Productivity.

Monmouthshire-Ross—females: employees in employment 1952-68*

TABLE 7A.15

Description	'000		%		Change 1952–68	
	1952	1968	1952	1968	%	Differential †
Total	**30·8**	**38·3**	**100·0**	**100·0**	**25·0**	**3·3**
Primary	0·4	0·4	1·4	0·9	−18·6	1·4
Agriculture, forestry and fishing	0·4	0·3	1·2	0·8	−16·1	7·2
Coal-mining	0·0	0·0	0·1	0·1	−37·1	−44·8
Mining and quarrying (other)	0·0	0·0	0·1	0·1	4·0	−13·8
Manufacturing	11·3	11·6	36·9	30·4	2·8	5·1
Food, drink and tobacco	1·8	2·0	5·9	5·2	9·8	9·8
Chemicals and allied industries	1·7	0·7	5·7	1·8	−60·5	−58·3
Iron and steel, tubes, castings, etc.	1·0	1·3	3·1	3·4	37·2	44·5
Light metals, copper, brass, etc.	0·5	0·3	1·5	0·7	−43·2	−18·8
Shipbuilding and mechanical engineering	0·8	1·3	2·5	3·4	71·2	46·9
Electrical engineering	1·7	1·5	5·7	4·0	−11·7	−58·5
Vehicles	0·6	0·8	1·9	2·1	42·0	52·9
Metal goods not elsewhere specified	0·7	0·9	2·4	2·4	25·5	20·6
Textiles	0·8	0·7	2·5	1·8	− 7·6	26·4
Leather, clothing and footwear	0·9	0·9	2·9	2·3	− 2·5	13·5
Bricks, pottery, glass, cement, etc.	0·2	0·2	0·5	0·4	− 1·9	10·5
Timber, furniture, etc.	0·1	0·1	0·2	0·2	28·8	26·7
Paper	0·0	0·3	0·2	0·7	463·3	450·2
Printing and publishing	0·2	0·2	0·8	0·8	−10·0	−22·4
Other manufacturing industries	0·4	0·5	1·3	1·4	29·8	0·4
Construction	0·2	0·3	0·5	0·8	76·8	−29·0
Services	18·7	26·0	61·1	67·9	38·8	0·7
Gas, electricity and water	0·2	0·3	0·8	0·8	29·1	−23·2
Railways	0·2	0·1	0·7	0·1	−73·5	−30·5
Road transport	0·4	0·4	1·3	1·1	− 9·6	− 0·4
Transport (other)	0·3	0·5	1·1	1·4	67·4	33·8
Retail distribution	3·6	5·8	11·8	16·1	59·4	7·8
Distribution less retail	0·8	0·6	2·7	1·6	−27·3	−52·4
Insurance, banking, finance, professional and scientific services less education, medical and dental	0·7	1·5	2·4	3·9	102·3	43·5
Miscellaneous services, less catering and motor repairers	2·5	3·3	8·3	8·7	30·3	25·4
Catering, hotels, etc.	3·0	1·8	9·8	4·7	−39·1	−15·1
Motor repairers	0·1	0·5	0·5	1·3	255·8	83·0
Education	2·6	5·0	8·4	13·0	94·7	−31·8
Medical and dental	2·4	5·0	7·7	13·0	110·6	41·1
Government: national	0·3	0·3	0·8	0·7	− 1·6	−18·1
Government: local	1·5	1·0	4·9	2·8	−34·3	−50·8

* Figures may not add to totals due to roundings. Numbers of employees in employment less than 50 are shown as 0·0.

† The differential is obtained by subtracting the percentage change in Great Britain over 1952-68 from the corresponding local percentage change.

Source: Department of Employment and Productivity.

Great Britain—total: employees in employment 1952-68: analysis of change*

TABLE 7A.16

Description	'000			Change as % of total change 1952–68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**3,620·5**	**1,531·7**	**2,088·8**	**100·0**	**100·0**	**100·8**
Primary		729·3	−729·3		47·6	−34·9
Agriculture, forestry and fishing		342·2			22·3	
Coal-mining		365·8			23·9	
Mining and quarrying (other)		21·3			1·4	
Manufacturing	755·7	442·9	312·8	20·9	28·9	15·0
Food, drink and tobacco		8·1			0·5	
Chemicals and allied industries	6·7			0·2		
Iron and steel, tubes, castings, etc.		15·1			1·0	
Light metals, copper, brass, etc.		19·1			1·2	
Shipbuilding and mechanical engineering	133·4			3·7		
Electrical engineering	272·8			7·5		
Vehicles less aircraft		53·3			3·5	
Aircraft	50·0			1·4		
Metal goods not elsewhere specified	80·9			2·2		
Textiles		224·4			14·7	
Leather, clothing and footwear		122·7			3·0	
Bricks, pottery, glass, cement, etc.		0·2			0 0	
Timber, furniture, etc.	8·5			0·2		
Paper	54·2			1·5		
Printing and publishing	59·8			1·7		
Other manufacturing industries	89·4			2·5		
Construction	249·3		249·3	6·9		11·9
Services	2,615·5	359·5	2,256·0	72·2	23·5	108·0
Gas, electricity and water	38·7			1·1		
Railways		241·3			15·8	
Road transport	2·5			0·1		
Transport (other)	146·4			4·0		
Retail distribution	504·2			13·9		
Distribution less retail	114·5			3·2		
Insurance, banking, finence, professional and scientific services less education, medical end dental	348·9			9·6		
Miscellaneous services, less catering and motor repairers	142·1			3·9		
Catering, hotels, etc.		91·0			5·9	
Motor repairers	161·0			4·4		
Education	704·4			19·5		
Medical and dental	365·8			10·1		
Government: national		27·2			1·8	
Government: local	87·0			2·4		

* Figures may not add to totals due to roundings.

Source: Department of Employment and Productivity.

Great Britain—males: employees in employment 1952-68: analysis of change*

TABLE 7A.17

Description	'000			Change as % of total change 1952–68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**1,721·9**	**1,147·3**	**574·6**	**100·0**	**100·0**	**100·0**
Primary		707·6	−707·6		61·7	−123·1
Agriculture, forestry and fishing		318·6			27·8	
Coal-mining		366·9			32·0	
Mining and quarrying (other)		22·1			1·9	
Manufacturing	534·7	158·4	376·3	31·1	13·8	65·5
Food, drink and tobacco		8·1			0·7	
Chemicals and allied industries	9·8			0·6		
Iron and steel, tubes, castings, etc.		11·6			1·0	
Light metals, copper, brass, etc.		10·3			0·9	
Shipbuilding and mechanical engineering	78·3			4·5		
Electrical engineering	163·9			9·5		
Vehicles less aircraft		33·4			2·9	
Aircraft	43·6			2·5		
Metal goods not elsewhere specified	72·1			4·2		
Textiles		46·1			4·0	
Leather, clothing and footwear		48·9			4·3	
Bricks, pottery, glass, cement, etc.	10·3			0·6		
Timber, furniture, etc.	7·3			0·4		
Paper	44·6			2·6		
Printing and publishing	45·5			2·6		
Other manufacturing industries	59·3			3·4		
Construction	202·2		202·2	11·7		35·2
Services	985·0	261·3	703·7	57·2	24·5	122·5
Gas, electricity and water	19·0			1·1		
Railways		224·2			19·5	
Road transport	6·6			0·5		
Transport (other)	99·6			5·8		
Retail distribution	69·4			4·0		
Distribution less retail	59·6			3·5		
Insurance, banking, finance, professional and scientific services less education, medical and dental	167·7			9·7		
Miscellaneous services, less catering and motor repairers	108·2			6·3		
Catering, hotels, etc.	26·4			1·5		
Motor repairers	104·5			6·1		
Education	201·5			11·7		
Medical and dental	65·0			3·6		
Government: national		57·1			5·0	
Government: local	55·1			3·2		

* Figures may not add to totals due to roundings.

Source: Department of Employment and Productivity.

Great Britain—females: employees in employment 1952-68: analysis of change*

TABLE 7A.18

Description	'000			Change as % of total change 1952–68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**1,976·5**	**462·3**	**1,514·2**	**100·0**	**100·0**	**100·0**
Primary	1·9	23·6	−21·7	0·1	5·1	−1·4
Agriculture, forestry and fishing		23·6			5·1	
Coal-mining	1·1			0·1		
Mining and quarrying (other)	0·8			0·0		
Manufacturing	234·4	297·9	−63·5	11·9	64 4	−4·2
Food, drink and tobacco	0·0			0·0		
Chemicals and allied industries		3·1			0·7	
Iron and steel, tubes, castings, etc.		3·5			0·8	
Light metals, copper, brass, etc.		8·8			1·9	
Shipbuilding and mechanical enginsering	55·1			2·8		
Electrical engineering	108·9			5·5		
Vehicles less aircraft		19·9			4·3	
Aircraft	8 4			0·3		
Metal goods not elsewhere specified	8 8			0·4		
Textiles		178·3			38·6	
Leather, clothing and footwear		73·8			18·0	
Bricks, pottery, glass, cement, etc.		10·5			2·3	
Timber, furniture, etc.	1·2			0·1		
Paper	9·8			0·5		
Printing and publishing	14·3			0·7		
Other manufacturing industries	30·1			1·5		
Construction	47·1		47·1	2·4		3·1
Services	1,693·1	140·8	1,552·3	85·7	30·5	102·5
Gas, electricity and water	19·7			1·0		
Railways		17·1			3·7	
Road transport		6·3			1 4	
Transport (other)	46·8			2·4		
Retail distribution	434·8			22·0		
Distribution less retail	54·7			2·8		
Insurance, banking, finance, professional and scientific services less education, medical and dental	181·2			9·2		
Miscellaneous services, less catering and motor repairers	33·9			1·7		
Catering, hotels, etc.		117·4			25·4	
Motor repairers	56·5			2·9		
Education	502·9			25·4		
Medical and dental	300·8			15·2		
Government: national	29·9			1·5		
Government: local	31·9			1·6		

* Figures may not add to totals due to roundings. Increases or decreases of employees in employment less than 50 are shown as 0·0.
Source: Department of Employment and Productivity.

Study Area—total: employees in employment 1952-68: analysis of change*

TABLE 7A.19

Description	'000			Change as % of total change 1952–68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**125·1**	**47·0**	**78·1**	**100·0**	**100·0**	**100·0**
Primary		13·5	−13·5		28·7	−17·3
Agriculture, forestry and fishing		5·3			11·3	
Coal-mining		7·8			16·6	
Mining and quarrying (other)		0·4			0·9	
Manufacturing	42·5	9·9	32·6	34·0	21·1	41·7
Food, drink and tobacco	2·4			1·9		
Chemicals and allied industries		3·1			6·6	
Iron and steel, tubes, castings, etc.	5·4			4·3		
Light metals, copper, brass, etc.		2·6			5·5	
Shipbuilding and mechanical engineering	16·2			12·9		
Electrical engineering	3·7			3·0		
Vehicles less aircraft		2·9			6·2	
Aircraft	2·6			2·1		
Metal goods not elsewhere specified	4·1			3·3		
Textiles	2·2			1·8		
Leather, clothing and footwear		0·3			0·6	
Bricks, pottery, glass, cement, etc.	0·0			0·0		
Timber, furniture, etc.		0·8			1·7	
Paper	4·9			3·9		
Printing and publishing		0·2			0·4	
Other manufacturing industries	1·0			0·8		
Construction	5·3		5·3	5·0		8·1
Services	76·3	23·6	52·7	61·0	50·2	67·4
Gas, electricity and water	4·4			3·5		
Railways		10·9			23·2	
Road transport	1·0			0·8		
Transport (other)		2·2			4·7	
Retail distribution	13·5			10·8		
Distribution less retail		0·1			0·2	
Insurance, banking, finance, professional and scientific services less education, medical and dental	8·8			6·9		
Miscellaneous services, less catering and motor repairers	1·8			1·4		
Catering, hotels, etc.		5·3			11·3	
Motor repairers	4·1			3·3		
Education	25·2			20·1		
Medical and dental	15·0			12·0		
Government: national		5·1			10·9	
Government: local	2·7			2·2		

* Figures may not add to totals due to roundings. Increases or decreases of employees in employment less than 50 are shown as 0·0.
Source: Department of Employment and Productivity.

Study Area—males: employees in employment 1952-68: analysis of change*

TABLE 7A.20

Description	'000			Change as % of total change 1952–68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**68·8**	**37·6**	**31·2**	**100·0**	**100·0**	**100·0**
Primary		13·8	−13·8		36·7	−44·2
Agriculture, forestry and fishing		5·6			14·9	
Coal-mining		7·7			20·5	
Mining and quarrying (other)		0·5			1·3	
Manufacturing	36·9	7·8	29·6	53·6	19·4	94·9
Food, drink and tobacco	2·0			2·9		
Chemicals and allied industries		1·3			3·5	
Iron and steel, tubes, castings, etc.	5·1			7·4		
Light metals, copper, brass, etc.		2·1			5·6	
Shipbuilding and mechanical engineering	13·3			19·3		
Electrical engineering	2·7			3·9		
Vehicles less aircraft		2·7			7·2	
Aircraft	3·2			4·7		
Metal goods not elsewhere specified	3·1			4·5		
Textiles	2·7			3·9		
Leather, clothing and footwear		0·1			0·3	
Bricks, pottery, glass, cement, etc.	0·1			0·1		
Timber, furniture, etc.		0·9			2·4	
Paper	4·1			6·0		
Printing and publishing	0·6			0·9		
Other manufacturing industries		0·2			0·5	
Construction	5·0		5·0	7·3		16·0
Services	26·9	18·6	10·4	39·1	43·9	33·3
Gas, electricity and water	3·4			4·9		
Railways		10·7			28·5	
Road transport	1·1			1·6		
Transport (other)		2·6			7·4	
Retail distribution	2·5			3·6		
Distribution less retail		0·7			1·9	
Insurance, banking, finance, professional and scientific services less education, medical and dental	3·4			4·9		
Miscellaneous services, less catering and motor repairers	1·7			2·5		
Catering, hotels, etc.	0·1			0·1		
Motor repairers	2·6			3·8		
Education	7·4			10·8		
Medical and dental	2·3			3·3		
Government: national		2·3			6·1	
Government: local	2·4			3·5		

* Figures may not add to totals due to roundings.

Source: Department of Employment and Productivity.

Study Area—females: employees in employment 1952-68: analysis of change*

TABLE 7A.21

Description	'000			Change as % of total change 1952-68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	60·0	13·3	46·7	100·0	100·0	100·0
Primary	0·3	0·1	0·2	0·5	0·8	0·4
Agriculture, forestry and fishing	0·3			0·5		
Coal-mining		0·1			0·8	
Mining and quarrying (other)	0·0			0·0		
Manufacturing	7·8	4·7	3·1	13·0	35·3	6·6
Food, drink and tobacco	0·3			0·5		
Chemicals and allied industries		1·8			13·5	
Iron and steel, tubes, castings, etc.	0·4			0·7		
Light metals, copper, brass, etc.		0·7			5·3	
Shipbuilding and mechanical engineering	2·9			4·8		
Electrical engineering	1·1			1·8		
Vehicles less aircraft		0·2			1·5	
Aircraft		0·5			3·8	
Metal goods not elsewhere specified	1·0			1·7		
Textiles		0·5			3·8	
Leather, clothing and footwear		0·3			2·3	
Bricks, pottery, glass, cement, etc.		0·0			0·0	
Timber, furniture, etc.	0·1			0·2		
Paper	0·8			1·3		
Printing and publishing		0·7			5·3	
Other manufacturing industries	1·2			2·0		
Construction	1·3		1·3	2·2		2·8
Services	50·6	8·5	42·1	84·3	63·9	90·1
Gas, electricity and water	1·1			1·8		
Railways		0·2			1·5	
Road transport		0·1			0·8	
Transport (other)	0·6			1·0		
Retail distribution	10·9			18·2		
Distribution less retail	0·6			1·0		
Insurance, banking, finance, professional and scientific services less education, medical and dental	5·1			8·5		
Miscellaneous services, less catering and motor repairers	0·1			0·2		
Catering, hotels, etc.		5·4			40·6	
Motor repairers	1·5			2·5		
Education	17·6			29·3		
Medical and dental	12·7			21·2		
Government: national		2·8			21·1	
Government: local	0·4			0·7		

* Figures may not add to totals due to roundings. Increases or decreases of employees in employment less than 50 are shown as 0·0.
Source: Department of Employment and Productivity.

Bristol-Bath—total: employees in employment 1952-68: analysis of change*

TABLE 7A.22

Description	'000			Change as % of total change 1952-68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**79·1**	**23·9**	**46·2**	**100·0**	**100·0**	**100·0**
Primary		4·7	— 4·7		19·7	—10·2
Agriculture, forestry and fishing		1·6			6·7	
Coal-mining		2·5			10·5	
Mining and quarrying (other)		0·6			2·5	
Manufacturing	19·8	7·7	12·1	28·2	32·2	28·2
Food, drink and tobacco	1·8			2·6		
Chemicals and allied industries		1·3			5·4	
Iron and steel, tubes, castings, etc.		0·1			0·4	
Light metals, copper, brass, etc.		0·5			2·1	
Shipbuilding and mechanical engineering		0·2			0·8	
Electrical engineering	2·8			4·0		
Vehicles less aircraft		2·6			10·9	
Aircraft	9·8			14·0		
Metal goods not elsewhere specified	2·2			3·1		
Textiles		0·3			1·3	
Leather, clothing and footwear	0·0			0·0		
Bricks, pottery, glass, cement, etc.		0·4			1·7	
Timber, furniture, etc.		0·9			3·8	
Paper	3·2			4·6		
Printing and publishing		0·7			2·9	
Other manufacturing industries		0·7			2·9	
Construction	6·4		6·4	9·1		13·9
Services	43·9	11·5	32·4	62·6	48·1	70·1
Gas, electricity and water	2·6			3·7		
Railways		3·8			15·9	
Road transport	0·2			0·3		
Transport (other)		1·4			5·9	
Retail distribution	8·8			12·6		
Distribution less retail	0·1			0·1		
Insurance, banking, finance, professional and scientific services less education, medical and dental	4·8			6·8		
Miscellaneous services, less catering and motor repairers	3·4			4·9		
Catering, hotels, etc.		1·6			8·7	
Motor repairers	1·0			1·4		
Education	14·3			20·4		
Medical and dental	8·7			12·4		
Government: national		4·3			18·0	
Government: local		0·4			1·7	

* Figures may not add to totals due to roundings. Increases or decreases of employees in employment less than 50 are shown as 0·0.

Source. Department of Employment and Productivity.

Bristol-Bath—males: employees in employment 1952-68: analysis of change*

TABLE 7A.23

Description	'000			Change as % of total change 1952–68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**38·5**	**18·8**	**19·7**	**100·0**	**100·0**	**100·0**
Primary		5·0	−5·0		26·5	−25·3
Agriculture, forestry and fishing		2·0			10·5	
Coal-mining		2·4			13·0	
Mining and quarrying (other)		0·8			3·0	
Manufacturing	17·5	5·6	11·9	45·4	29·8	60·3
Food, drink and tobacco	1·4			3·6		
Chemicals and allied industries		0·5			2·6	
Iron and steel, tubes, castings, etc.		0·0			0·0	
Light metals, copper, brass, etc.		0·4			2·1	
Shipbuilding and mechanical engineering		0·2			1·0	
Electrical engineering	1·9			5·0		
Vehicles less aircraft		2·4			12·5	
Aircraft	9·5			24·8		
Metal goods not elsewhere specified	1·8			4·8		
Textiles		0·1			0·4	
Leather, clothing and footwear	0·0			0·1		
Bricks, pottery, glass, cement, etc.		0·4			1·9	
Timber, furniture, etc.		0·9			4·7	
Paper	2·7			7·0		
Printing and publishing	0·1			0·2		
Other manufacturing industries		0·9			4·6	
Construction	5·5		5·5	14·4		28·2
Services	15·5	8·2	7·2	40·2	43·8	36·8
Gas, electricity and water	1·7			4·4		
Railways		3·8			20·4	
Road transport	0·3			0·9		
Transport (other)		1·8			9·6	
Retail distribution	2·1			5·6		
Distribution less retail		0·8			2·9	
Insurance, banking, finance, professional and scientific services less education, medical and dental	2·0			5·1		
Miscellaneous services, less catering and motor repairers	1·9			4·9		
Catering, hotels, etc.	0·4			1·0		
Motor repairers	0·5			1·2		
Education	5·2			13·8		
Medical and dental	1·4			3·6		
Government: national		1·7			9·2	
Government: local		0·3			1·6	

* Figures may not add to totals due to roundings. Increases or decreases of employees in employment less than 50 are shown as 0·0.
Source: Department of Employment and Productivity.

Bristol-Bath—females: employees in employment 1952-68: analysis of change*

TABLE 7A.24

Description	'000			Change as % of total change 1952–68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**33·9**	**7·0**	**26 9**	**180·0**	**100·0**	**180·0**
Primary	0·5		0·5	1·3		1·7
Agriculture, forestry and fishing	0·4			1·2		
Coal-mining	0·0			0·1		
Mining and quarrying (other)	0·0			0·0		
Manufacturing	2·5	2·4	0·0	7·3	35·0	0·1
Food, drink and tobacco	0·4			1·1		
Chemicals and allied industries		0·8			11·7	
Iron and steel, tubes, castings, etc.		0·0			0·4	
Light metals, copper, brass, etc.		0·1			1·3	
Shipbuilding and mechanical engineering	0·0			0·1		
Electrical engineering	0·8			2·4		
Vehicles less aircraft		0·3			4·1	
Aircraft	0·5			0·9		
Metal goods not elsewhere specified	0·4			1·2		
Textiles		0·3			3·6	
Leather, clothing and footwear		0 0			0 1	
Bricks, pottery, glass, cement, etc.		0 0			0 7	
Timber, furniture, etc.		0·0			0·7	
Paper	0·6			1·3		
Printing and publishing		0·9			12·2	
Other manufacturing industries	0·1			0·4		
Construction	0·9		0·9	2·7		3·4
Services	30·0	4·5	25·5	88·6	65·0	94·8
Gas, electricity and water	0·9			2·8		
Railways	0·1			0 4		
Road transport		0·1			1·0	
Transport (other)	0 4			1·0		
Retail distribution	6·6			19 5		
Distribution less retail	0·6			1·8		
Insurance, banking, finance, professional and scientific services less education, medical and dental	2·9			6·6		
Miscellaneous services, less catering and motor repairers	1·5			4·5		
Catering, hotels, etc.		1·9			27·3	
Motor repairers	0·6			1·6		
Education	9·1			26·8		
Medical and dental	7·3			21·7		
Government: national		2·6			35·9	
Government: local		0·0			0·7	

* Figures may not add to totals due to roundings. Increases or decreases of employees in employment less than 50 are shown as 0 0.
Source: Department of Employment and Productivity.

North Gloucestershire—total: employees in employment 1952-68: analysis of change*

TABLE 7A.25

Description	'000			Change as % of total change 1952-68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	46·8	25·6	21·2	100·0	100·0	100·0
Primary	0·2	6·4	− 6·2	0·4	25·0	−29·2
Agriculture, forestry and fishing		2·6			10·2	
Coal-mining		3·6			14·6	
Mining and quarrying (other)	0·2			0·4		
Manufacturing	23·7	9·7	14·0	50·6	37·9	66·0
Food, drink and tobacco	0·6			1·7		
Chemicals and allied industries	0·9			1·9		
Iron and steel, tubes, castings, etc.		0·1			0·4	
Light metals, copper, brass, etc.		1·2			4·7	
Shipbuilding and mechanical engineering	14·0			30·0		
Electrical engineering	1·2			2·6		
Vehicles less aircraft		1·0			3·9	
Aircraft		7·1			27·7	
Metal goods not elsewhere specified	1·5			3·2		
Textiles	1·9			4·1		
Leather, clothing and footwear		0·3			1·2	
Bricks, pottery, glass, cement, etc.	0·3			0·6		
Timber, furniture, etc.	0·2			0·4		
Paper	0·9			1·9		
Printing and publishing	0·7			1·5		
Other manufacturing industries	1·3			2·8		
Construction		0·5	− 0·5		2·0	− 2·4
Services	22·9	9·0	13·9	48·9	35·2	85·6
Gas, electricity and water	0·7			1·5		
Railways		2·6			10·2	
Road transport	0·2			0·4		
Transport (other)		0·4			1·8	
Retail distribution	2·5			5·3		
Distribution less retail		0·2			0·8	
Insurance, banking, finance, professional and scientific services less education, medical and dental	2·6			5·6		
Miscellaneous services, less catering and motor repairers		2·5			9·8	
Catering, hotels, etc.		2·7			10·5	
Motor repairers	1·9			4·1		
Education	8·1			17·3		
Medical and dental	3·3			7·1		
Government: national		0·6			2·3	
Government: local	3·6			7·7		

* Figures may not add to totals due to roundings.

Source: Department of Employment and Productivity.

North Gloucestershire—males: employees in employment 1952-68: analysis of change*

TABLE 7A.26

Description	'000			Change as % of total change 1952-68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**28·2**	**19·5**	**8·7**	**100·0**	**100·0**	**100·0**
Primary	0·2	8·2	−6·0	0·7	31·6	−63·7
Agriculture, forestry and fishing		2·6			13·3	
Coal-mining		3·6			18·3	
Mining and quarrying (other)	0·2			0·7		
Manufacturing	19·5	6·3	11·2	69·1	42·4	129·1
Food, drink and tobacco	1·0			3·4		
Chemicals and allied industries	0·6			3·0		
Iron and steel, tubes, castings, etc.		0·2			1·1	
Light metals, copper, brass, etc.		0·8			4·3	
Shipbuilding and mechanical engineering	11·7			41·6		
Electrical engineering	0·7			2·5		
Vehicles less aircraft		0·9			4·5	
Aircraft		6·3			32·4	
Metal goods not elsewhere specified	1·1			3·8		
Textiles	2·1			7·4		
Leather, clothing and footwear	0·0			0·0		
Bricks, pottery, glass, cement, etc.	0·3			1·1		
Timber, furniture, etc.	0·2			0·6		
Paper	0·7			2·4		
Printing and publishing	0·5			1·6		
Other manufacturing industries	0·4			1·5		
Construction		0·7	− 0·7		3·6	− 8·2
Services	8·5	4·4	4·2	30·3	22·4	47·8
Gas, electricity and water	0·5			1·9		
Railways		2·5			12·8	
Road transport	0·2			0·6		
Transport (other)		0·5			2·4	
Retail distribution	0·4			1·2		
Distribution less retail		0·5			2·7	
Insurance, banking, finance, professional and scientific services less education, medical and dental	1·1			3·8		
Miscellaneous services, less catering and motor repairers		0·3			1·7	
Catering, hotels, etc.		0·3			1·7	
Motor repairers	1·3			4·6		
Education	1·9			6·9		
Medical and dental	0·5			1·8		
Government: national		0·2			1·2	
Government: local	2·7			9·4		

* Figures may not add to totals due to roundings. Increases or decreases of employees in employment are shown as 0·0.
Source: Department of Employment and Productivity.

North Gloucestershire—females: employees in employment 1952-68: analysis of change*

TABLE 7A.27

Description	'000			Change as % of total change 1952-68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**19·4**	**7·2**	**12·3**	**100·0**	**100·0**	**100·0**
Primary	0·1	0·2	— 0·1	0·4	2·2	— 0·7
Agriculture, forestry and fishing	0·0			0·0		
Coal-mining		0·2			2·2	
Mining and quarrying (other)	0·1			0·3		
Manufacturing	4·7	2·0	2·7	24·1	27·8	22·0
Food, drink and tobacco		0·2			2·3	
Chemicals and allied industries	0·1			0·5		
Iron and steel, tubes, castings, etc.	0·1			0·3		
Light metals, copper, brass, etc.		0·3			4·8	
Shipbuilding and mechanical engineering	2·3			11·9		
Electrical engineering	0·5			2·8		
Vehicles		0·2			2·5	
Aircraft		0·8			11·5	
Metal goods not elsewhere specified	0·4			2·1		
Textiles		0·2			2·9	
Leather, clothing and footwear		0·3			3·8	
Bricks, pottery, glass, cement, etc.	0·0			0·0		
Timber, furniture, etc.	0·1			0·3		
Paper	0·2			0·9		
Printing and publishing	0·2			0·8		
Other manufacturing industries	0·9			4·6		
Construction	0·3		0·3	1·5		2·1
Services	14·4	5·0	9·4	74·0	70·0	78·3
Gas, electricity and water	0·1			0·5		
Railways		0·1			1·6	
Road transport	0·1			0·3		
Transport (other)	0·0			0·2		
Retail distribution	2·2			11·2		
Distribution less retail	0·2			1·1		
Insurance, banking, finance, professional and scientific services less education, medical and dental	1·5			7·6		
Miscellaneous services, less catering and motor repairers		2·2			31·2	
Catering, hotels, etc.		2·3			32·6	
Motor repairers	0·5			2·8		
Education	6·1			31·5		
Medical and dental	2·8			14·3		
Government: national		0·3			4·5	
Government: local	0·9			4·6		

* Figures may not add to totals due to roundings. Increases or decreases of employees in employment less than 50 are shown as 0·0.
Source: Department of Employment and Productivity.

Monmouthshire-Ross—total: employees in employment 1952-68: analysis of change*

TABLE 7A.28

Description	'000			Change as % of total change 1952-68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	24·4	14·3	10·1	100·0	100·0	100·0
Primary		2·9	2·9		20·3	—28·7
Agriculture, forestry and fishing		1·1			7·7	
Coal-mining		1·7			11·9	
Mining and quarrying (other)		0·1			0·7	
Manufacturing	11·2	4·7	6·5	45·9	32·9	64·4
Food, drink and tobacco		0·2			1·4	
Chemicals and allied industries		2·7			18·9	
Iron and steel, tubes, castings, etc.	5·7			23·4		
Light metals, copper, brass, etc.		1·1			7·7	
Shipbuilding and mechanical engineering	2·3			9·4		
Electrical engineering		0·3			2·1	
Vehicles	0·8			3·3		
Metal goods not elsewhere specified	0·4			1·6		
Textiles	0·6			2·5		
Leather, clothing and footwear		0·1			0·7	
Bricks, pottery, glass, cement, etc.	0·2			0·8		
Timber, furniture, etc.		0·2			1·4	
Paper	0·9			3·7		
Printing and publishing		0·1			0·7	
Other manufacturing industries	0·3			1·2		
Construction	0·2		0·2	0·8		2·0
Services	13·0	6·7	6·3	53·3	46·9	62·4
Gas, electricity and water	1·2			4·9		
Railways		4·5			31·5	
Road transport	0·5			2·0		
Transport (other)		0·3			2·1	
Retail distribution	2·2			9·0		
Distribution less retail	0·1			0·4		
Insurance, banking, finance, professional and scientific services less education, medical and dental	1·2			4·9		
Miscellaneous services, less catering and motor repairers	0·9			3·7		
Catering, hotels, etc.		1·1			7·7	
Motor repairers	1·2			4·9		
Education	2·7			11·1		
Medical and dental	3·0			12·3		
Government: national		0·3			2·1	
Government: local		0·5			3·5	

* Figures may not add to totals due to roundings.

Source: Department of Employment and Productivity.

Monmouthshire-Ross—males: employees in employment 1952-68: analysis of change*

TABLE 7A.29

Description	'000			Change as % of total change 1952-68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**13·8**	**11·2**	**2·6**	**100·0**	**198 0**	**180·0**
Primary		2 8	— 2·8		24·6	—107·2
Agriculture, forestry end fishing		1 0			9 0	
Coal-mining		1·8			14·7	
Mining and quarrying (other)		0·1			0·9	
Manufacturing	9·5	3·2	6 3	89·3	28·9	245·6
Food, drink and tobacco		0·4			3·2	
Chemicals and allied industries		1·7			15·4	
Iron and steel, tubes, castings, etc.	5·3			38·3		
Light metals, copper, brass, etc.		0·8			7·3	
Shipbuilding and mechanical engineering	1·8			12·7		
Electrical engineering		0·0			0·2	
Vehicles	0·8			4·1		
Metal goods	0·2			1·4		
Textiles	0·7			5·0		
Leather, clothing and footwear		0·0			0·4	
Bricks, pottery, glass, cement, etc.	0·2			1·2		
Timber, furniture, etc.		0·2			1·8	
Paper	0·7			4·8		
Printing and publishing		0·1			0·6	
Other manufacturing industries	0·2			1·7		
Construction	0·1		0·1	0·9		4·6
Services	4·1	5·2	— 1·1	29·8	48·5	—43·0
Gas, electricity and water	1·1			7·9		
Railways		4·4			38·9	
Road transport	0·5			4·0		
Transport (other)		0·5			4·7	
Retail distribution	0·0			0·2		
Distribution less retail	0·3			2·3		
Insurance, banking, finance, professional and scientific services less education, medical and dental	0·4			2·8		
Miscellaneous services, less catering and motor repairers	0·1			1·0		
Catering, hotels, etc.	0·1			0·4		
Motor repairers	0·6			6·0		
Education	0·3			2·1		
Medical and dental	0·4			3·0		
Government: national		0·3			2·9	
Government: local	0·0			0·1		

* Figures may not add to totals due to roundings. Increases or decreases of employees in employment less than 50 are shown as 0 0.

Source: Department of Employment and Productivity.

Monmouthshire-Ross—females: employees in employment 1952-68: analysis of change*

TABLE 7A.30

Description	'000			Change as % of total change 1952-68		
	Increases	Decreases	Net	Increases	Decreases	Net
Total	**11·4**	**3·7**	**7·7**	**100·0**	**100·0**	**100·0**
Primary	0·0	0·1	− 0·1	0·0	1·9	− 0·9
Agriculture, forestry and fishing		0·1			1·6	
Coal-mining		0·0			0·3	
Mining and quarrying (other)	0·0			0·0		
Manufacturing	1·9	1·6	0·3	16·5	41·9	4·1
Food, drink and tobacco	0·2			1·6		
Chemicals and allied industries		1·0			28·2	
Iron and steel, tubes, castings, etc.	0·4			3·1		
Light metals, copper, brass, etc.		0·2			5·3	
Shipbuilding and mechanical engineering	0·5			4·6		
Electrical engineering		0·2			5·5	
Vehicles	0·2			2·1		
Metal goods not elsewhere specified	0·2			1·6		
Textiles		0·1			1·5	
Leather, clothing and footwear		0·0			0·6	
Bricks, pottery, glass, cement, etc.		0·0			0·1	
Timber, furniture, etc.	0·0			0·1		
Paper	0·2			2·0		
Printing and publishing		0·0			0·6	
Other manufacturing industries	0·1			1·1		
Construction	0·1		0·1	1·1		1·7
Services	9·4	2·1	7·3	62·4	56·2	95·1
Gas, electricity and water	0·1			0·6		
Railways		0·2			4·0	
Road transport		0·0			1·2	
Transport (other)	0·2			1·9		
Retail distribution	2·2			19·0		
Distribution less retail		0·2			6·0	
Insurance, banking, finance, professional and scientific services	0·8			6·7		
Miscellaneous services, less catering and motor repairers	0·8			6·6		
Catering, hotels, etc.		1·2			31·0	
Motor repairers	0·4			3·1		
Education	2·4			21·4		
Medical and dental	2·6			22·9		
Government: national		0·0			0·1	
Government: local		0·5			13·6	

* Figures may not add to totals due to roundings. Increases or decreases of employees in employment less than 50 are shown as 0·0.
Source: Department of Employment and Productivity.

8 ECONOMIC DEVELOPMENT TO 1976

Introduction

8.1. This chapter sets out our assessment of the economic prospects of the Study Area for the period to 1976.

8.2. The main objectives of the assessment are to estimate the overall strength of the economy of the Area and within that estimate to identify any particular strengths or weaknesses that exist and that will in the future have e bearing on decisions about the location of population. Indications of strong industrial growth in certain areas would suggest, for example, that in those areas it would be relatively easier to provide the range of opportunities which an influx of people would need, whereas contrary indications would suggest that it would require relatively greater effort to create new jobs.

8.3. To evaluate the situation in 1976 three main steps were necessary:

i assessment of the development of the national economy up to 1976;

ii projections of population and employment distribution and structure in 1976 for the Study Area as a whole and for its sub-areas;

iii assessment of the reliability of these projections with an analysis of some of the major economic sectors in terms of growth and decline.

8.4. Labour demand forecasts to 1976 for Great Britain were produced jointly by a number of Departments in 1969 and made available to the Unit. Projections of labour demand on Severnside were in part derived from these by assuming a continuation of relative trends between Severnside and Great Britain employment in the main industrial groupings and then considering them by main sectors to see whether they were plausible. Further details are given in Annex 8A at the end of this chapter. They were then compared with estimates of the probable size of the working population based on estimates of Severnside activity rates in 1976 applied to projections of the adult (15+) population.

8.5. Since the national forecasts (even for a time as near as 1976) are subject to fairly wide margins of error, the Severnside forecasts, which include, as an additional source of error, the assumptions that must be made about future differentials, may be even further from the truth. We do not claim therefore that our forecasts give more than the broad order of magnitude of the likely developments.

8.6. During the course of the Industrial Survey carried out in the Severnside area in 1967, we asked industrialists to forecast their male and female employment in 1971. The general conclusion from the results was that on the whole the industrialists' forecasts tended to be over-optimistic about employment, especially in the light of subsequent developments in the economic situation, and at variance with our own. However, they provided a conspectus of industrialists' views about the short-term prospects of the Study Area and were taken into account in our work.

Table 8a

Study Area and Great Britain: civilian population changes 1966-76*

Area	Civilian population 1966	Total change		Natural change		Balance mainly net migration		Civilian population 1976
	'000	'000	%	'000	%	'000	%	'000
Great Britain	52,897·1	3,055·6	5·8	3,236·0	6·1	−180·4	−0·3	55,952·7
Study Area	**1,635·1**	**179·2**	**11·0**	**120·2**	**7·4**	**59·0**	**3·8**	**1,814·3**
Bristol-Bath	891·7	89·2	10·0	64·2	7·2	25·0	2·8	980·9
North Gloucestershire	452·1	52·8	11·7	32·8	7·3	20·0	4·4	504·9
Monmouthshire-Ross	291·3	37·2	12·8	23·2	8·0	14·0	4·8	328·5

* Figures on 1968 boundaries.

Source: Office of Population Censuses and Surveys.

8.7. Table 8a gives the population forecasts for Great Britain and Severnside specially prepared by the Office of Population Censuses and Surveys for the Unit. The two components, natural change and net migration[26] ere shown separately. The net migration component is based on the assumption that the absolute level of net migration over the ten-yeer period 1966-76 will be two-thirds of the quantity of net migration recorded over the fifteen-year period 1951-66.[27]

8.8. The information evallable for Great Britain led the Government Actuary to assume thet the rate of natural change would run at about the same level as that experienced in the five-year period 1961-66, that is somewhere between 0·6 and 0·7 per cent a year. Severnside, however, recorded a gradueI differential increase compared with Great Britain in this component over the period 1951-66; so it has been postulated that the 1966-76 rate of natural change would be slightly higher in the Study Area, between 0·7 and 0·8 per cent a year. It has also been assumed that throughout East Severnside the rate would be 0·70 per cent a year, while for Monmouthshire-Ross it would be 0·77.

8.9. The result of these projections over the period 1966-76 on the age structure of the Area is to reduce the proportion of people over 45 end to increase the proportion of young people between 0-14 (Teble 8b). There would also be a slight fall in the proportion of young working-age persons in the 15-44 band.[28] This trend towards a younger popuiation accords with the comparable Great Britain projections which for the period 1966-76 show a 1·5 per cent increase in the 0-14 age group and a fall of 0·6 per cent in the over 45s. Monmouthshire-Ross would still have the youngest age structure, but there would then be little difference between the other two sub-areas.

Table 8b

Study Area and Great Britain: age/sex distribution of civilian population 1976*

%

Area	Total	Males	Females
Great Britain	**100·0**	**48·6**	**51·4**
0-14	24·8	12·7	12·1
15-44	38·9	19·8	19·4
45-64(m)/59(f)	19·8	11·0	8·8
65+(m)/60+(f)	16·5	5·3	11·2
Study Area	**100·0**	**48·7**	**51·3**
0-14	25·4	13·1	12·3
15-44	39·0	19·5	19·5
45-64(m)/59(f)	19·7	11·0	8·7
65+(m)/60+(f)	15·9	5·1	10·8
Bristol-Bath	**100·0**	**48·4**	**51·6**
0-14	25·2	12·9	12·3
15-44	39·1	19·5	19·6
45-64(m)/59(f)	19·6	11·0	8·8
65+(m)/60+(f)	16·2	5·1	11·1
North Gloucestershire	**100·0**	**48·5**	**51·5**
0-14	25·6	13·2	12·4
15-44	38·2	19·0	19·2
45-64(m)/59(f)	19·9	11·0	8·9
65+(m)/60+(f)	16·4	5·3	11·1
Monmouthshire-Ross	**100·0**	**49·9**	**50·1**
0-14	26·0	13·5	12·5
15-44	40·2	20·6	19·6
45-64(m)/59(f)	19·7	11·1	8·6
65+(m)/60+(f)	14·1	4·7	9·3

* Figures are on 1968 boundaries.

Source: Office of Population Censuses and Surveys.

1976 forecasts

National forecasts

8.10. The forecasts of labour demand (i.e. employees in employment) for Great Britain made available to the Unit are given in detail in Tables 8B.1 to 8B.3 and are summarised by main sectors of industry in Table 8c.

8.11. The level of national employment in 1976 will depend on the availeble labour supply and on the overall level of demand in the economy in so far as this affects both the amount of labour avellable and the extent to which it is taken up. Any forwerd employment estimates are therefore affected not only by demographic and social factors but also by assumptions about the progress in meintaining the improvement in the balance of payments, the growth of output and productivity and the incidence of taxation; they are therefore liable to considerable uncertainty, especially when broken down to industriel sectors or particular industries. These limitations must be borne in mind when using these forecasts.

8.12. As can be seen from Table 8c, total employment is expected to show little change from current levels, about 200,000 in the case of males and 300,000 in the case of femaies. The decline in employment in the primery sector (especially in the extrective industries) should continue at a considerably slower rate than in the recent past. Manufacturing employment is expected to show slight growth. Employment in the construction industry should recover from the current low level of activity to a position nearer that of the mid-1960s. Services as a whole are

(26) The letest availeble estimate of the level of net migration 1951-66 is 99,000 (Table 7a) which would imply e level of 66,000 for 1966-76. However, the level of 59,000 (Teble 8e) was obtained by using mid-year estimates of civilian popuietion before revisions could be incorporated from the results of the 1966 Sample Census of Populetion. This puts our population estimates on the cautious side.

(27) In the published estimetes of netional and regionel populations the migration assumptions are also based on past trends, but ere modified to take into account views on economic prospects end other factors. For the purpose of our enalysis, however, we chose to use past trends only in order that any modifications in the light of economic prospects, etc, could be separetely distinguished. For thet reeson the popuietion projections in this report are slightly out of line with figures published elsewhere, which are in any case revised yeerly in the light of developments.

(28) In 1972 the school leeving age will rise from 15 yeers to 16 years and hence, strictly speaking, the age group 15-44 will not all be of working age after that dete.

Table 8c

Great Britain: employees in employment 1968 and 1976

'000

	Total		Males		Females	
	1968	1976	1968	1976	1968	1976
Total	**22,645·3**	**23,145·0**	**14,150·6**	**14,349·0**	**8,494·5**	**8,796·0**
Primary	898·9	486·0	800·8	428·0	98·8	58·0
Manufacturing	8,473·9	8,599·0	5,794·9	6,009·0	2,679·0	2,590·0
Construction	1,538·4	1,593·0	1,446·8	1,511·0	91·6	82·0
Services	11,734·1	12,467·0	6,108·8	6,401·0	5,625·3	6,066·0

Source: Department of Employment and Productivity/Central Unit for Environmental Planning.

Table 8d

Study Area: employees in employment 1968 and 1976

	Total			Males			Females		
	1968 '000	1976 '000	% change	1968 '000	1976 '000	% change	1968 '000	1976 '000	% change
Total	**623·0**	**669·2**	**10·6**	**396·3**	**433·7**	**6·6**	**223·7**	**255·5**	**14·2**
Primary	17·2	10·7	−37·8	14·5	9·1	−37·2	2·7	1·6	−40·7
Manufacturing	252·8	281·2	11·2	190·0	211·4	11·3	62·9	69·8	11·0
Construction	42·4	46·7	10·1	40·1	44·5	11·0	2·3	2·2	−4·3
Services	310·5	350·6	12·9	154·8	168·7	9·0	155·8	181·9	16·8

Source. Department of Employment and Productivity/Central Unit for Environmental Planning.

expected to continue to be the fastest growing sector of the economy in terms of employment, in line with developments in most advanced countries. Education is likely to be the fastest growing activity owing to the increases in child population and raising of the school leaving age. Medical (including dental) services and local government are also expected to grow exceptionally fast.

Severnside employment

8.13. Severnside's share of national employment has expanded steadily if slowly since the early 1950s, although at different rates in different industries. Using regression equations[29] based on these rates in each main industrial grouping, local employment was projected to 1976 and the resultant forecasts then modified in the light of local information and existing policy restraints.

8.14. Our forecasts for the Area are given in Table 8d and in greater detail in Tables 8B.4 to 8B.6. Figure 9a illustrates the change from 1968 to 1976 in the Area and Figure 9b gives a comparison with Great Britain.

8.15. Tables 8B.7 to 8B.15 give the detailed figures of the forecasts by sub-areas and by separate industries. In the following paragraphs we consider the history of recent developments in the main industries to assess whether the employment projections derived statistically are likely to represent a reasonable forecast.

(29) See Annex 8A para. 3.

Sector forecasts to 1976

Agriculture

8.16. Farms both in acreage terms and in terms of individual enterprises are tending to increase in size. This is necessary in order to obtain the benefits of larger scale operation and technological advances. Small farm businesses are thus at a disadvantage because of limited resources for adaptation to a more competitive environment. Furthermore, the selective expansion of the industry's output in the coming years can be expected to reinforce these tendencies.

8.17. The Ministry of Agriculture, Fisheries and Food estimated that 25,000 people were engaged in agriculture and 1,000 in forestry in Severnside in June 1968. The numbers engaged in fishing are so small that they do not affect the total. These figures include the self-employed, omitted from the figures in Teble 8d. Farming in Severnside is mainly dependent on dairying with arable farming in some parts and livestock-rearing prominent in the hill areas around the northern edge of the Area. These types of farming are important elements in British agriculture and their continuation can be regarded as secure.

8.18. Small and very small farms occur in significant concentrations over relatively little of Severnside, mainly in the South Wales valleys. As with small farms everywhere, their future is speculative. Some may expand through more intensive farming and survive as full-time farms, others may amalgamate, while others again may survive as part-time businesses supplementing

Figure 9a Study Area: employees in employment—1968 and 1976

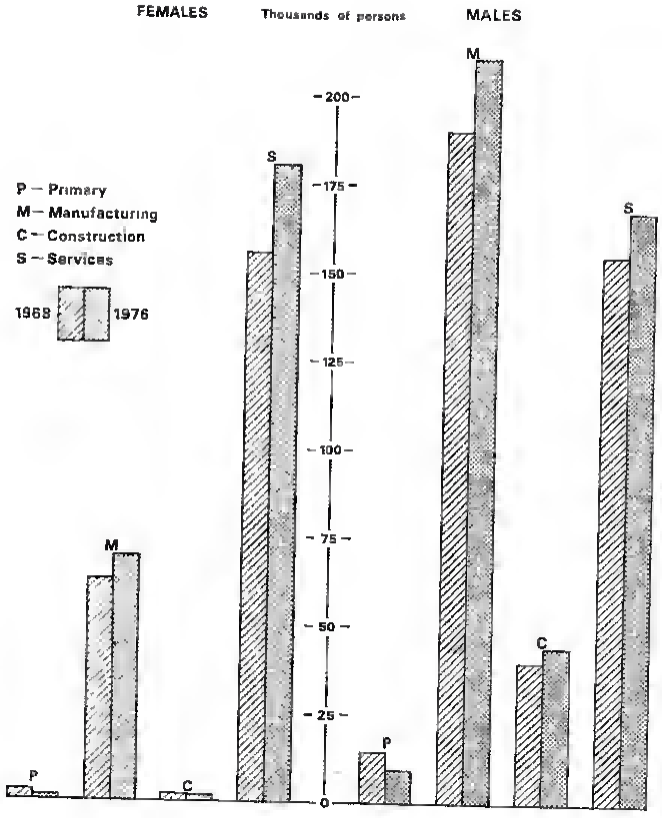
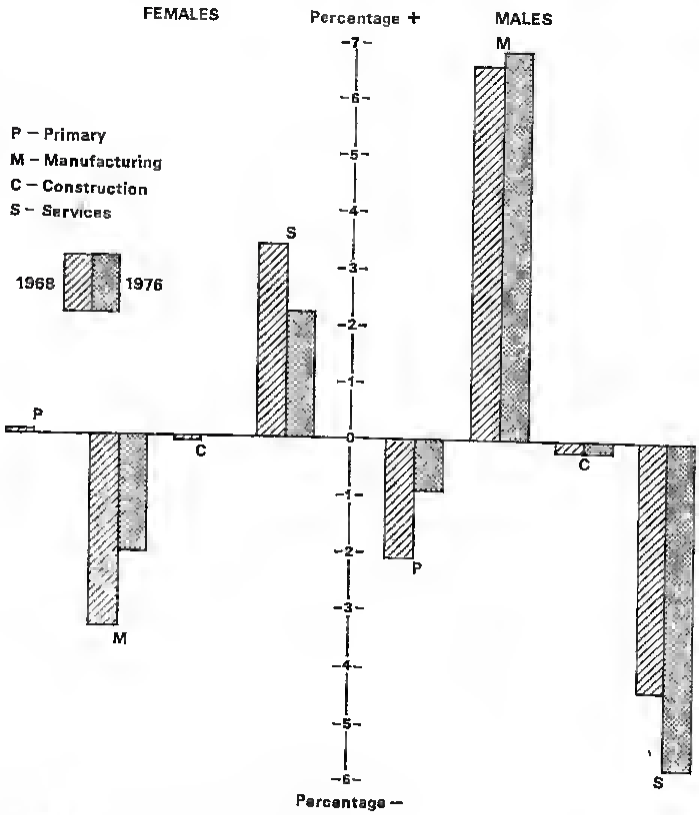


Figure 9b Study Area: employees in employment—1968 and 1976—comparison with Great Britain

The figures are obtained by subtracting the percentage of employment in each sector for Great Britain from the corresponding figure for Severnside



Source: Department of Employment and Productivity/Central Unit for Environmental Planning

income earned elsewhere. Though the separate units may lose their identity, or become part-time farms, farming as such in these areas is not threatened by these structural changes.

8.19. In its projections of manpower in agriculture the Ministry of Agriculture, Fisheries and Food provides figures only for a five-year period and for the UK as a whole. Projections over longer periods or for smaller areas, because they are merely extrapolations of past trends, are subject to very wide margins of error. However, neither national projections nor our information on local conditions indicate any need to modify the 1976 employment projections for this sector made by us.

Iron and steel

8.20. The seven steel plants on Severnside are all situated in Monmouthshire and are controlled by the British Steel Corporation. Between them they employ over 14,000 men, which is nearly a fifth of the total male labour force in the Welsh part of the Study Area. Three of the plants, including the largest, which is the modern integrated Spencer Works, are concerned primarily with the production of strip mill products, and the others produce stainless and special steels, electrical sheet, tubes, pipes and wire. There are, in addition, a few privately owned iron foundries producing cylinder block castings for the car industry.

8.21. When the British Steel Corporation was first set up in 1967 it was administered and organised primarily by geographical divisions and thus all but one (the tube plant) of the steel plants in South Wales were under the same divisional control. On 29 March 1970, the structure of the Corporation was reorganised into Product Divisions comprising four Iron and Steel-making Divisions and two other Divisions covering Chemicals and Constructional Engineering. The Steel-making Divisions comprise the Strip Mill Division (the biggest in terms of turnover) with its headquarters at Cardiff, which now controls four of the plants in the Study Area, and the Special Steels Division, the Tubes Division, and the General Steels Division each of which controls one of the remaining plants.

8.22. The Spencer plant produces some 2·2 million tons of sheet steel, coil, light plates and spiral welded pipes a year. Built in the early sixties, this coastal plant is one of the most modern in the country and has not had the rationalisation problems and redundancies which are affecting some of the other plants of the Corporation. Some of the existing potential has not yet been fully exploited and the decision of February 1970 to invest a further £42 million at Llanwern to increase the steel-making capacity of the plant will allow the fuller use of this potential. The new additions to the plant will be in operation by 1974, and will increase crude steel output by 1·3 million tons and could provide up to 1,000 additional jobs, bringing total employment to some 9,500 persons, nearly all men. The Corporation has also announced a £45 million plan for the Ebbw Vale steelworks, which though outside the Study Area has strong linkages with the Spencer Works. Under the plan, which is expected to be realised by 1976, steel-making will end in Ebbw Vale and be replaced by a hot strip mill, tinning line and other facilities. The net job run-down is expected to be not more than 1,300 and possibly much less.

8.23. The other six steel plants in the Monmouthshire part of the Area are smaller in scale than Llanwern and employ 5,800 workers altogether. The one at Panteg, which makes special stainless steels, is well located for taking advantage of a growing market in this product.

8.24. Taken as a whole, the steel industry in this part of Wales is closely linked with consumer durable industries and is also a heavy exporter of its products. It has growing markets and is further assisted by its relatively good location in relation to the rest of Great Britain. If the British Steel Corporation's 1975 target for crude steel of over 32 million tons is to be met, further substantial expansions to existing plants will have to take place and so it would appear that the future of the steel industry in this area is secure. Employment is, therefore, likely to rise as against a decline nationally, though past growth rates are unlikely to be sustained.

Aircraft

8.25. The two most important units of the aviation industry in the Severnside area are the Filton Division of BAC, and the Bristol Engine Division of Rolls-Royce at Patchway, Bristol. BAC has three divisions (Filton, Weybridge and Preston) and, although the divisions have a measure of autonomy, there are links between them through sub-contract work. The Rolls-Royce unit at Patchway is also a member of a larger group. These links must affect future prospects of BAC and Rolls-Royce in the area. There are also a number of aircraft equipment manufacturers in the Cheltenham-Gloucester area, and at Weston-super-Mare there is a factory belonging to Westland Aircraft, whose main establishment is at Yeovil.

8.26. The aircraft industry in Severnside has been largely converted to civil work in recent years as a result of defence cuts. It has benefited from this by streamlining and strengthening its organisation, but it is now heavily oriented towards the Concorde project. BAC Filton (aircraft) now employs about 7,000 people mainly on the Concorde airframe and would need to increase their labour force to around 10,000 in the mid-1970s if their civil projects go ahead according to plan. Rolls-Royce has a labour force at Patchway of 14,500 of which about 3,000 are dependent on the manufacture of Olympus 593 engines for the Concorde. If Concorde and various other projects all go well, the firm would probably need to increase their labour force by 4,000 in the first half of the 1970s, 2,000 of which would be in respect of Concorde. There is some doubt as to whether this additional labour demand could be recruited in the Bristol area. If it cannot, the companies would have to sub-contract outside Severnside. The difficulties of expansion are increased by the fact that the complex lies on the northern fringe of Bristol, beyond which the nearest centres of any size are expected to have their own local labour supply problems. Both BAC and Rolls-Royce expect labour supply to be a constricting factor in any possible future expansion without a substantial enlargement of the housing supply in South Gloucestershire. Generally speaking aircraft companies with a healthy outlook can attract mobile labour from other parts of the country, provided

the housing is available. If, of course, some of the ancillary activities in the Filton-Patchway complex could be hived off to the Development Areas the amount of additional labour and housing required in the Bristol area would be reduced. At tha moment it is not possible to estimate the likelihood of this, but in discussing expansion projects it is a possibility which must be borne in mind.

8.27. Much therefore depends on the future of Concorde. The manufacturer's target is to obtain initial orders for Concorde during 1971 and to have the aircratt in commercial service by 1973. If the current target production programme is achieved, the expansion of 5,000 in the combined Rolls-Royce and BAC work force, referred to above, should occur by 1974. The work force on this project should reach its peak in 1973-74 and then remain approximately static until the later 1970s.

8.28. Clearly if the Concorde project were cancelled the effects would be widely felt in the Bristol area. Although about 10,000 people are directly employed on the project, the final number of redundancies cannot be estimated precisely since it might on the one hand be decreased if Rolls-Royce (or BAC) were able to bring in work from other Divisions, and on the other increased if BAC were to close down its Filton operations entirely.

8.29. Apart from the Concorde engines, Rolls-Royce also manufacture the Pegasus, M45H, and RB199 engines, which could sustain a reasonable level of employment at Patchway even if work were ended on the Olympus 593. Prospects should be reasonably good, although the future of the M45H engine is largely bound up with that of the German VFW614 aircraft, the success of which is not as yet guaranteed.

8.30. In the Gloucester-Cheltenham area economic prospects for the aircraft equipment industry, employing some 7,000-8,000 people, mainly rest in two large and progressive companies which are likely to depend over the long-term more on their ability to expand their employment than to secure orders for their products. The industry is engaged mainly in fairly general work and is not greatly dependent on Concorde.

8.31. In assessing overall future employment prospects in the aircraft industry it is important to bear in mind the heavy dependence of tha aeroepace industry on Government support. The future level of support depends on a complex of factors and cannot accurately be predicted in the long-term. However, quite apart from considerations relating to Concorde and engine production already discussed, there is likely to be some expansion in labour requirements in the near future for other projects, including 800-1,000 on the airframe side and a few hundred on space satellites and carbon fibres, provided there are no major cancellations.

8.32. As regards helicopters, although major expansion is not foreseen at present, Westland have a reasonable programme of work arising partly from its involvement in the Anglo-French military helicopter project which has just reached the production stage and certain prospects of diversification. In the long-term Westland could benefit if helicopters came to be used more extensively for civilian purposes, with consequences for employment at Weston-super-Mare.

Other manufacturing industry

8.33. In addition to aircraft manufacture, the main observable feature of the capital goods section is the predominance of high quality specialised engineering, covering in particular a wide range of factory machinery, plant and equipment. This sector is very diverse. Larga firms do not predominate. There are few weak parts of the sector, which during the 1950s and 1960s expanded at two or three times the national rate. It should be capable of expanding its employment needs for many years to come, but intensive efforts to raise productivity may yield a slower growth of employment than in the past.

8.34. A significant part of the labour force producing non-durable consumer goods is employed in four groups of industries; namely paper and board (mainly an adjunct to consumer packaging in East Severnside); printing and publishing; food, drink and tobacco; and clothing and footwear. The first two groups are in a strong position and a substantial part of the printing industry in the Area is connected with packaging. The remaining sectors, food and footwear, contain a number of substantial and progressive firms; the sector includes a very large producer of ice-cream at Gloucester. The employment advance in this sector as a whole was moderate in the 1950s and 1960s, although well above the national rate and is not expected to be higher.

8.35. The remaining manufacturing sectors—durable consumar goods and intermediate products—showed little or no increase in the 1950s and 1960s and there is little sign of a much larger durable consumer goods industry developing in East Severneide. However, on present knowledge growth will continue at a moderate pace. East Severnside is a relatively emall centre of the chemical industry but thie is expected to continue to grow, and at Avonmouth there is a large physical capacity for its further expansion.

8.36. Overall in manufacturing employment the 1976 projections show a substantial growth in all three sub-areas in the coming years. They would imply on East Severnside a rate of growth in the first half of the 1970s faster than prevailed in the early and middle 1960s and more in lina with the high growth rates of the 1950s. This could be justified because these parts of the Area have been more resistant to declines in employment since 1966 than the national average and have a wide epread of progressive firms. Moreover, employment in the aircraft industry is expected to increase (due mainly to the Concorde) as against the sharp declines in the North Gloucestershire section of this industry in the early 1960s. There is on the other hand the possibility that the effects of regional policy measures may be more strongly felt in these areas in the early 1970s than they were in the early 1960s, although, however strict idc control may be, it would not under present legislation affect the reoccupation of existing factory premises or the development within existing premises of indigenous firms. On balance, we feel that these higher growth rates in the early 1970e are likely to be achieved provided the Concorde development does go ahead.

The power industries

8.37. For convenience we deal here with all the power-providing industries, although their

employment figures ere allocated to different sectors for statistical purposes. In coal production there are three collieries in the Study Area: Kilmersdon in Bristol-Bath, and Blaenserchan and Hafodyrynys in Monmouthshire-Ross. The future of all three could be uncertain in the long run. The supply of labour in the Newport-Cwmbran-Pontypool area will, however, be much affected by the future of collieries nearby in the rest of South East Wales.

8.38. The Wales Gas Board has no plans for new production plant in the Monmouthshire-Ross sub-area. The conversion to natural gas, when it begins, will be undertaken by mobile labour recruited from all parts of Wales. In Bristol-Bath the South Western Gas Board has incentive schemes which cover most of the manual workers and a 1969 Clerical Work Standards exercise is expected to raise the productivity of the large office staff employed in the Bristol area. The same exercise will also affect the North Gloucestershire sub-area, where increased business is expected after the conversion to natural gas in 1970.

8.39. The increased use of new techniques and the introduction of productivity payment schemes by the Central Electricity Generating Board is likely to reduce manpower requirements up to 1976. After that the manpower position for the remainder of the 1970s will depend on the development of load, the organisation of the Board, progress with productivity schemes and other measures to improve efficiency.

8.40. The Central Electricity Genereting Board has applied for statutory consent for the construction in due course of a nuclear power stetion et Portskewett near Chepstow in Monmouthshire. If consent is obteined, the construction of the nuclear power station should not affect any possible development at the Caldicot Level which we heve considered. The outer perimeter of the nuclear site would be some 2½-5½ miles outside and downwind of the possible industrial erea. Local employment in the construction industry will rise during the building period.

8.41. There are no oil refineries in the Study Area and no companies currently appear interested in setting up there. Possible sites near Newport and Portishead were identified in 1963 but these would be unsuiteble for the present generation of mammoth crude-oil tankers. Petroleum distribution depots are located at Newport, Cardiff, Barry, Chepstow, Gloucester and Avonmouth and will probably be developed in response to any future increase in demand for products, but there is no reason to expect en unusual increase in the rate of growth of demand in this area.

Construction

8.42. The construction industry is very volatile in its demand for labour because it is so dependent on activity and growth in other spheres. We have already seen how the size of the construction labour force on Severnside varied during the 1950s and 1960s with the onset and completion of mejor works (see parae. 7.57 and 7.73). Construction is predominantly a male-employing industry with a large migratory element in the work force who move round the country from one large project to another, sometimes with the same nationally based firm but often on a casual self-employed basis. Analysis of unemployment statistics confirms the uncertain nature of the work with construction workers easily being the largest contingent of the unemployed—male unemployment in construction amounted to 20 per cent through much of 1969.

8.43. After major peaks in the early- and mid-1960s the size of the workforce in 1968 was not much above its size in 1952. As it happens neither Bristol-Bath nor North Gloucestershire have exceptionel constructional tasks in prospect for the early 1970s, but Monmouthshire-Ross has a number (see para. 8.57). Accordingly we consider that the size of the construction workforce in Bristol-Bath and North Gloucestershire should not be very different in 1976 from its level in 1968, but the level of the construction workforce in Monmouthshire-Ross is expected to grow from 6,000 male jobs in 1968 to 9,000 in 1976.

Ports

8.44. The bulk of imports into Severnside industries are of basic materials and unprocessed foodstuffs, end almost all imports through Severnside ports go to locel industry and local distribution points. It would seem that as far as inward traffic is concerned the future of each main port is dependent on the future demand for inputs into the (relatively few) industries it serves. Switches of oversea origin of these inputs would not materially affect the demand on the local port, but changes in demand would be immediately reflected in the change in the level to which the local port is used.

8.45. The mein elements in the inward traffic in East Severnside are products for the grain mills, enimal foods, aluminium, fertilisers and chemical plants at Avonmouth, the paper and tobacco factories at Bristol, the timber industries and distributors at Bristol end Gloucester. Newport's inward traffic is for the steel plents in the area, while Cerdiff's (in the Economic Survey Area) is partly for the steel plente, partly for the local refinery and petroleum distribution points.

8.46. For exports, the country of destination is a major factor in determining which of the nation's ports will be used unless the commodity is en intermediate one such as iron and steel. Bristol's outward traffic originates mainly outside Severnside, so that the future level of Bristol's outward traffic will tend to depend on the port's ebility to compete with other ports in Great Britain for the export traffic of the Midlands and South East. Apart from increasing competition from other ports in the country's main exporting areas, there is the geographical disadvantage that Bristol suffers in reletion to most of Europe—which is end probably will continue to be Britain's fastest growing export merket. This latter fector not only influences Bristol's chance of attracting treffic from the Midlends, but also affects the exports of the area's own industries. Exports ere well below one-tenth of the total tonnage handled and the bulk imports are likely to remein the most important element in port activity.

8.47. The South Weles ports can best be considered as a whole since they are organised by British Transport Docks Boerd es e one-port

system. They are increasing their traffic in petroleum products and steel and are also widening the range of cargoes they handle (e.g. motor cars from the Midlands). Steel (and petroleum products) are commodities which are expensive to handle by inland transport in relation to their value; thus overseas country of destination does not have the same degree of influence as in the case of finished manufactured goods. Steel manufacturers therefore use local ports for export to a greater extent than other industries would—even if similar patterns of overseas destinations prevailed. In sum, for traffic both in and out, South Wales ports are heavily dependent on the iron and steel industry and on Swansea's petroleum refinery and distribution points; their prospects are therefore tied mainly to the future of these activities. Increased productivity will tend to reduce employment in the ports generally and so far as the area as a whole is concerned this tendency is not likely to be counterbalanced by the expected increases in throughput. Generally we do not see the Severnside ports as being major stimulants to the economy of Severnside.

Service industry

8.48. We have estimated that the total increase in service employment in the Area over the 1968-76 period should be about 40,000, which is more than half the estimated increase of total employment. In reaching this figure we have allowed not only for the expected increase nationally in the proportion of employment in the service trades, but also for the trend growth in population expected in the Area. We also consider that with the Area's exceptionally favourable position on the national road network there will be increases in the road transport and distributive trades above the expected national trends, where indeed in some sections falls are expected. Professional services should also do well because of the important regional roles of the main towns. On the other hand, in line with our statistical projections, we have only allowed for an average increase in education and for an increase in local government employment well below national trends and in view of the expected increases in child and adult populations in the Area these may be underestimated.

Developments in the sub-areas

8.49. Table 8e summarises the employees in employment forecasts for each of the sub-areas, Table 8f compares the forecasts with 1968 and Figure 10 illustrates these figures graphically. The projected increases for the three sub-areas are Bristol-Bath 10·1 per cent, North Gloucestershire 9·1 per cent and Monmouthshire-Ross 14·4 per cent as compared with a Great Britain increase of 2·2 per cent. The following section discusses the implications of the figures for each sub-area.

Bristol-Bath

8.50. Since 1968 anxieties about employment prospects in Bristol-Bath have diminished although the future of the aerospace industry

Table 8e

Sub-areas: employees in employment 1976

'000

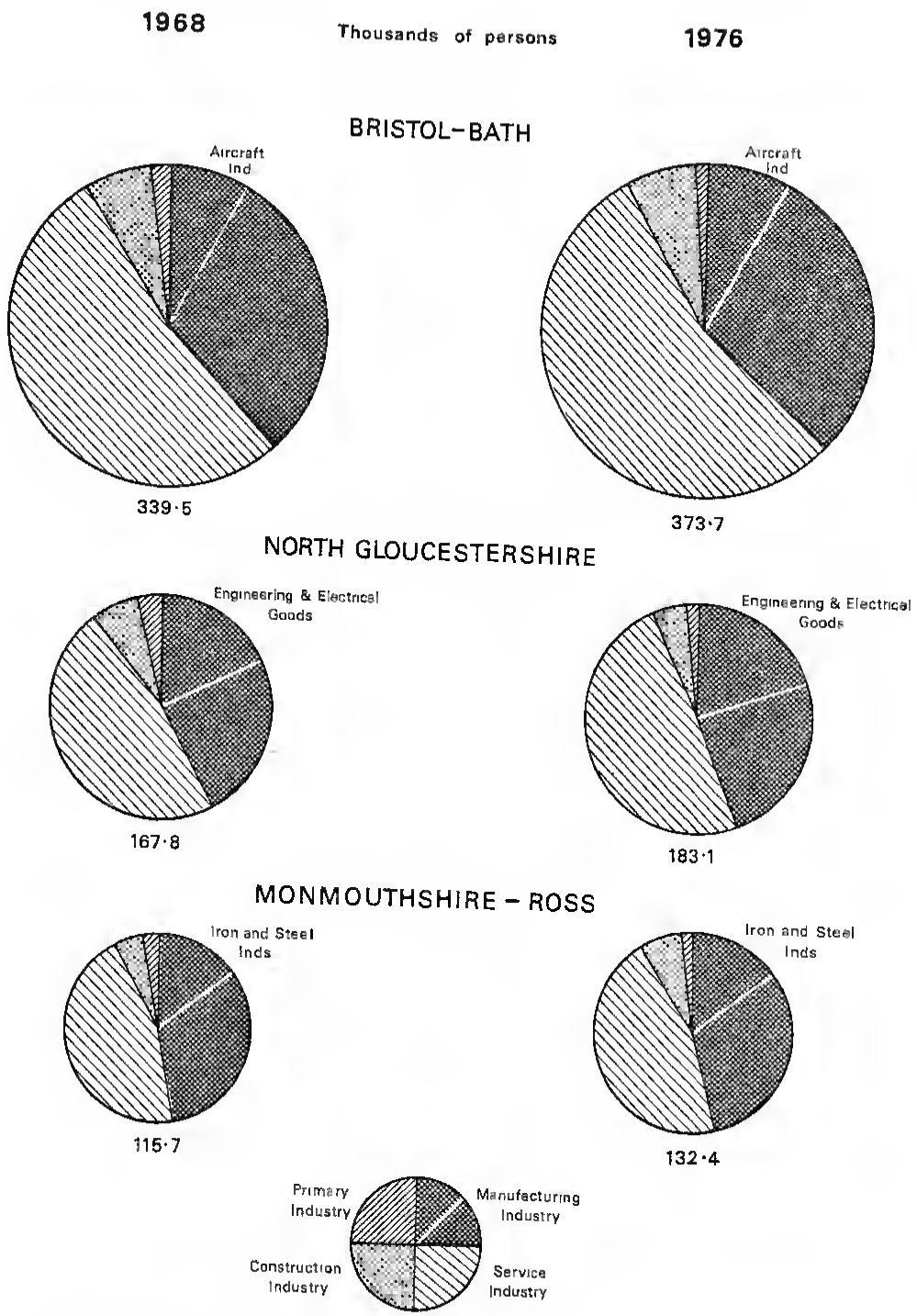
	Study Area			Bristol-Bath			North Gloucestershire			Monmouthshire-Ross		
	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females
Total	**689·2**	**433·7**	**255·5**	**373·7**	**230·8**	**142·9**	**183·1**	**116·3**	**66·8**	**132·4**	**86·6**	**45·8**
Primary	10·7	9·1	1·6	3·9	3·2	0·7	4·4	3·7	0·7	2·4	2·2	0·2
Manufacturing	281·2	211·4	69·8	140·0	102·3	37·7	80·0	61·4	18·6	81·2	47·7	13·5
Construction	46·7	64·5	2·2	27·5	26·0	1·5	9·9	9·5	0·4	9·3	9·0	0·3
Services	350·6	168·7	181·9	202·3	99·3	103·0	88·8	41·7	47·1	59·5	27·7	31·8

Table 8f

Sub-areas: employees in employment 1968 and 1976

	Total			Males			Females		
	1968 '000	1976 '000	% Change	1968 '000	1976 '000	% Change	1968 '000	1976 '000	% Change
Study Area	**623·0**	**689·2**	**10·6**	**399·3**	**433·7**	**8·6**	**223·7**	**255·5**	**14·2**
Bristol-Bath	339·5	373·7	10·1	214·6	230·8	7·5	124·9	142·9	14·4
North Gloucestershire	167·8	183·1	9·1	107·3	116·3	8·4	60·5	66·8	10·4
Monmouthshire-Ross	115·7	132·4	14·4	77·4	86·8	11·9	38·3	45·8	19·6

Figure 10 Sub-areas: employment forecaste 1976



Source: Department of Employment and Productivity/Central Unit for Environmental Planning.

remains the major uncertainty in the area. If there are no major cancellations there is likely to be some expansion in labour requirements in the near future. On the other hand, if the Concorde project was abandoned the immediate impact would be considerable, even though recent achievements affecting engine contracts have diversified the industry to some extent so that it is no longer so dependent on the fate of a single aircraft (see paras. 8.25 onwards). Certainly employment would cease to grow for several years until the redundancies were absorbed.

8.51. Amongst other Bristol-Bath industries no major changes are expected in employment in the immediate future. Modest growth in the metal-using industries is likely, though our forecast figure is possibly over-optimistic. Substantial capital investment in the Avonmouth area in chemicals and non-ferrous metals is not expected to result in much growth in employment. Consumer goods industries have had redundancies recently (boots and shoes, pottery and chocolate), but should pick up with the growth in consumer spending. The clothing firms are short of female labour. Services have been on a downward trend since 1966, but the figures do not allow fully for the growing national Government sector, and some expansion of office and hotel employment is probable in Bristol and Bath. A substantial number of Ministry of Defence staff will be dispersed to Bath in the early 1970s and the new University there is growing rapidly. In view of the sub-area's excellent position, road transport and distribution should do well. Service industries should improve when the M5 makes pleasure travel from the West Midlands easier.

8.52. The part of the Bristol-Bath area with laast favourable prospects in the immediate future is Weston-super-Mare. In spite of substantial daily travel into Bristol, unemployment has been growing. The only expansions in manufacturing employment known to be under way in the area as the result of idc's granted in the past are comparatively minor ones.

North Gloucestershire

8.53. The immediate prospects of the main firms in the Gloucester, Cheltenham and Stroud areas do not suggest any dramatic improvement in the near future over the recent somewhat depressed situation (see para. 7.65). However, vacant industrial space resulting from the closure of several manufacturing firms in these towns in 1968 and 1969 has baen largely taken up and although some present impressions belie the fairly substantial growth in employment projected to 1976, this sub-area has recovered so fraquently in the past from adverse economic developments and has achieved such a very high average rate of growth in manufacturing employment that it is reasonable to take more notice of the general upward trend than of short-term fluctuations. Tha sub-area's inherent growth potential should reassert itself before long, although our projected employment levels may not be achieved precisely in 1976. Service employment should also continue upward in the busy towns of Gloucester and Cheltenham particularly in distribution and professional services etc.

8.54. In the Forest of Dean the local outlook is better than at any time for many years. Unemployment was well below the national average (and that of the rast of North Gloucestershire) for most of 1969, though it rose a little in early 1970 chiefly because of temporary stoppages due to troubles in the motor industry. The increased employment at Mitcheldean is one cause of this buoyancy.

Monmouthshire-Ross

8.55. The merger of Tirpentwys Colliery in November 1969 with Hafodyrynys resulted in approximately 80 workers being discharged as redundant. In the long-term this closure means a loss of 500 male employment opportunities in the district. On the other hand, Pontypool and Cwmbran have good prospects for industrial growth. According to estimates made early in 1970 there are over 2,300 manufacturing jobs in prospect for the whole local travel-to-work area. The Cwmbran New Town authority is pursuing a policy of building small advance factories and a number of other local authorities have designated land for industrial expansions. The future of the textiles industry seems assured but its size will depend entirely upon how ICI Fibres Ltd., meets the challenge of excess world production of nylon yarns. The metal-using industries seem likely to continue expanding but their output is dependent upon the requirements of the vehicles industry.

8.56. The signs are that Newport also has good prospects for industrial growth despite some recent redundancies. The new Business Statistics Office now being established will provide many clarical and higher grade jobs in an area which has a high proportion of manufacturing industry and low female activity rates. The construction of a further blast furnace at the Spencer Steelworks will provide jobs for 1,000 more men. Unemployment in early-1970 in the Newport travel-to-work area was running below that for Wales as a whole.

8.57. Major capital investment schemes include the construction of a dual carriageway road to link Newport with tha Ross Spur leading to the M5, and the provision of the two new berths at Newport Docks at a cost of £2½ million for handling timber imports and container ships. Statutory powers exist for tha building, should the need arise, of an ore terminal at Uskmouth to serve the British Steel Corporation's Monmouthshire works. There is also the proposal to construct a nuclear power station at Portskewett and the westward extension of the M4 motorway is in the road preparation pool. These projects will provide hundreds of construction jobs, although these are likely to be temporary and not necesessarily for indiganous labour.

8.58. Monmouth, Chepstow and Ross are in rural areas and have a high proportion employed in the service industries. Thase districts are excluded from the Development and Intermediate Areas and no substantial industrial development seems likely to take place in the foreseeable future. Several construction projects are in prospect which will increase employment opportunities in the area such as a tunnel to carry a power line under the rivers Wye and Severn. The growth of industry in the south-western part of the sub-area may indirectly benefit people living in Chepstow and Monmouth, especially as the road improvements of recent years give speedier

access to Newport. The level of unemployment in Abergavenny is relatively low and future employment prospects seem good.

8.59. It is too early to judge the effects of Intermediate Area incentives but it must be anticipated that some industrial growth will result, although the affected area may not do so well in manufacturing employment as the areas to the west where present Development Area incentives offer such strong inducements for both capital- and labour-intensive projects. The area's position in relation to communications is good and substantial increases in service employment are probable. With the Intermediate Area advantages now enjoyed by an important part, it seems reasonable to project a somewhat higher overall rate of growth for this sub-area than for the other two.

Comparison of labour demand and labour supply

8.60. Employment in an area can be forecast by projecting forward activity rates and applying these activity rates to the population projections to produce an estimate of total employees (employees in employment and wholly unemployed). This approach is usually regarded as indicating the level of labour supply, but in as much as the activity rate projection is based on past activity rates which are themselves only based on a partial measure of labour supply the projected values are not a complete measure of supply. Similarly it is conventional to associate employee in employment projections (see para. 8.10) with forecasts of labour demand, although past employees in employment figures are, strictly speaking, fulfilled demand which is also equivalent to satisfied supply, i.e. the point where the supply and demand curves meet. Nevertheless it is informative to compare 'supply' as arrived at via activity rate forecasts with 'demand' based on employees in employment projections. If they agree, this increases one's confidence in them, although it must be accepted that there could be inbuilt upward or downward biases in both approaches which would not thus be revealed.

8.61. 'Supply' was accordingly calculated for Severnside by taking the figures for population aged 15 and over shown in Table 8g and applying activity rates[30] to them. The projected activity rates for Severnside in 1976 are shown in Table 8h and are based on the assumption of the continuance of the trend over the period 1951-66 of the differential between the activity rates on Severnside and Great Britain. When these activity rates are applied to the assumed population figures for Severnside in 1976 and an allowance made for unemployment the resulting labour (supply) figures are as in Table 8i. For comparison the 1976 employees in employment (demand) figures resulting from the regression equation projections are also given.

(30) See Footnote (19) on page 69.

Table 8g

Study Area and Great Britain: population aged 15 and over 1968 and 1976*

'000

Area	1968		1976	
	Male	Female	Male	Female
Great Britain	19,627·0	21,445·8	20,087·0	21,989·4
Study Area	**607·0**	**666·3**	**646·2**	**706·3**
Bristol-Bath	330·4	367·5	348·8	385·4
North Gloucestershire	167·8	183·9	178·3	197·4
Monmouthshire-Ross	109·3	114·9	119·6	123·5

* 1968 figures obtained by applying 1966 age/sex percentages (see Table 7d) to 1968 totals of population.

Source: Department of Employment and Productivity/Office of Population Censuses and Surveys.

Table 8h

Study Area and Great Britain: projected activity rates 1976

%

Area	Males	Females
Great Britain	73	40
Study Area	**67**	**34**
Bristol-Bath	68	34
North Gloucestershire	65	34
Monmouthshire-Ross	76	35

Table 8i

Study Area: employees in employment 1976 '000

Area	'Supply'*			'Demand'†		
	Total	Males	Females	Total	Males	Females
Study Area	**664·5**	**425·9**	**238·6**	**689·2**	**433 7**	**255·5**
Bristol-Bath	354·0	224 0	130·0	373·7	230·6	142·9
North Gloucestershire	179·2	113·4	65·8	183·1	116·3	86·6
Monmouthshire-Ross	131·3	88·5	42 8	132·4	86·6	45·8

* 'Supply' based on activity rate trend projections.
† 'Demand' based on employees in employment projections.

8.62. Table 8i shows that if past trends in the growth of employees in employment on Severnside are projected forward to 1976 they will provide sufficient employment for the population expected in the Area by that date at reasonable assumptions about trends in national growth, net inward migration and activity rates. So far as the sub-areas are concerned, the 'supply'/'demand' position in 1976 for North Gloucestershire and Monmouthshire-Ross shown in Table 8i are almost exactly in balance, but for Bristol-Bath the figures indicate an excess of demand for labour, which may indicate that the estimate of demand for that sub-area is somewhat optimistic, or on the other hand that inward migration will be somewhat higher than that assumed in the population projections.

Conclusions

8.63. On the basis of all the above analysis there seems to be a reasonable prospect of sufficient continued growth of employment in each of the sub-areas to support inward migration at broadly the same rates as in the past. This is, however, subject not only to the uncertainties surrounding all projections, but also to the particular proviso that the Concorde project continues.

8.64. There are a number of general considerations which support this broad conclusion:

i the Area tends to do particularly well at times of national expansion which we assume will be the national position over most of our period of analysis;

ii our Industrial Survey showed the Area has many economic links with the Midlands and South East. It is likely, therefore to share in the expected high level of industrial activity and continued prosperity of these areas;

iii the links with the South East and Midlands will further improve with the completion of the M5 and M4 to Bristol and even better railway timings;

iv the Area has a labour force well trained in engineering and other skills which are likely to continue in high demand in the country as a whole, thus ensuring that any slack in the local economy is quickly taken up;

v with earnings at least on a par with the rest of the country (excluding the South East) the demand for local services should be well maintained;

vi the higher than national net output per employee in the Area may be due to higher capitalisation per employee, favourable location factors, or unusually high efficiency of labour or capital, but whatever the explanation it is hardly a negative factor for the further growth of the Area;

vii the regression equations on which the projections were based showed a good fit with past data back to 1952 in most cases and we have assumed that the more firmly past trends are established in this way, the more likely they are to continue into the future.

8.65. The main characteristics of trends on Severnside to 1976 relevant to our Study are summarised here for convenience:

i the age structure of the Severnside population is expected to change in line with the national one producing a slightly younger population;

ii the future of the Area will much depend upon the success of local firms and industries, but a faster rate of growth in manufacturing employment will probably be achieved in the first half of the 1970s than prevailed in the corresponding period in the 1960s;

iii in assessing the employment prospects for the aerospace industry its heavy dependence on Government support must be borne in mind;

iv the future of the steel industry in this Area is secure and has prospects for further growth linked as it is with consumer durable industries;

v there is a reasonable prospect of sufficient continued overall growth in employment in each of the sub-areas to support both natural increase and inward migration into the areas at broadly past rates.

Annex 8A

Note on employment forecasts

8A.1. The 1976 employees in employment forecasts for Great Britain given in Table 8c were obtained by extrapolating the trends predicted for the period 1970-72 in *The Task Ahead* and reconciling them (see Table below) with the estimate of total working population given in the *Department of Employment and Productivity Gazette* (March 1969). This involves assumptions regarding the level of unemployment—wholly unemployed assumed to be 2 per cent in 1976—self-employed and the armed forces.

Total working population 1976

	'000
Total Working Population	25,535
Employees in employment	23,145
Wholly unemployed	472
Self-employed	1,568
Armed forces	350

8A.2. For Great Britain and Severnside the industrial breakdown in 1976 is based on the 1958 Standard Industrial Classification. In addition the 1976 employees in employment by industry (and also the 1967 and 1968 figures) have been adjusted to be comparable with the 1966 figures for comparison with previous years, i.e. in the period before the introduction of SET. Figures for males and females were calculated separately throughout.

8A.3. The regression equations used to obtain the Study forecasts were:

$R = a+bt$
$R = a+bt+cW$
$R = a+bt+cW(-1)$
$R = a+bt+cW+cW(-1)$

Where for the extractive and manufacturing industries R is the ratio of local employees in employment to Great Britain employees in employment, and for the construction and service industries R is the ratio of employees in employment per head of population locally to employees in employment per head of population for Great Britain;

t is time (1950 = 0, 1951 = 1, etc);

W is Great Britain unemployment rate;

W(−1) is Great Britain unemployment rate lagged one year;

a, he regression constant,

b and c, are regression coefficients.

8A.4. All the regression equations were calculated for all industrial groupings and their goodness of fit was tested by means of the multiple correlation coefficient and the Durbin-Watson statistic. The best equation in the light of these coefficients was selected. Unfortunately, there is no simple index linking the values of these two statistics that will enable the regression equations to be easily ranked for an overall goodness of fit. Sometimes a choice had to be made between a fit which was indicated as good by the multiple correlation coefficient but which also showed signs of serial correlation as indicated by the Durbin-Watson statistic and a regression equation with not such a good value of the multiple correlation coefficients but not showing the same signs of serial correlation. The situation is further complicated because an examination of the residuals may indicate that although a regression equation exhibits high positive serial correlation (a marked cyclical effect), the period of time concerned covers a complete number of cycles, so that there may not be any appreciable bias in the slope of the regression equation. Negative serial correlation is not so serious as it is unlikely to introduce appreciable bias when considering a period stretching over 15 years from 1952-67.

8A.5. Once the regression equation for each industry in each sub-area which gave the best overall fit had been chosen, the employment in the sub-area in 1976 in that industry could be readily calculated on the basis of the Great Britain figure for 1976 given in Tables 8B.2 and 8B.3. For the construction and service industries the population forecasts for 1976 (Table 8a) had also to be used.

8A.6. Information provided by the local offices of the Department of Employment and Productivity, Ministry of Technology, South West Regional Office of the Ministry of Housing and Local Government and the Welsh Office was used to modify certain of the statistical projections, particularly those projections based on a regression equation with a poor statistical goodness of fit.

Great Britain—total: employees in employment 1968-76*

TABLE 8B.1

Description	'000		%		% change	% change per annum	
	1968	1976	1968	1976	1968-76	1968-76	1952-68
Total	**22,645·3**	**23,145**	**100·0**	**100·8**	**2 2**	**8·3**	**8·6**
Primary	898·9	486	4·0	2·1	−45·9	− 7·4	−3·6
Agriculture, forestry and fishing	413·6	241	1·8	1·0	−41·7	− 8·6	−3·7
Coal-mining	425·2	183	1·9	0·8	−57·0	−10·0	−3·8
Mining and quarrying (other)	60·1	62	0·3	0·3	3·2	0·4	−1·9
Manufacturing	8,473·9	8,599	36·4	37·1	1·5	0·2	0·2
Food, drink and tobacco	784·1	802	3·5	3·5	2·3	0·3	−0·1
Chemicals and allied industries	495·3	487	2·2	2·1	− 1·7	− 0·2	0·1
Iron and steel, tubes, castings, etc.	434·7	382	1·9	1·7	−12·1	− 1·8	−0·2
Light metals, copper, brass, etc.	138·7	158	0·6	0·7	13·9	1·6	−0·8
Shipbuilding and mechanical engineering	1,545·0	1,642	6·8	7·1	6·3	0·8	0·8
Electrical engineering	875·8	963	3·9	4·2	10·0	1·2	2·4
Vehicles less aircraft	563·3	599	2·5	2·6	6·3	0·8	−0·6
Aircraft	242·8	264	1·1	1·1	8·7	1·1	1·5
Metal goods not elsewhere specified	560·9	618	2·5	2·7	10·2	1·2	1·0
Textiles	687·2	607	3·0	2·6	−11·7	− 1·6	−1·7
Leather, clothing and footwear	544·2	480	2·4	2·1	−11·8	− 1·6	−1·3
Bricks, pottery, glass, cement, etc.	336·9	317	1·5	1·4	− 6·9	− 0·8	−0·0
Timber, furniture, etc.	295·9	287	1·3	1·2	− 3·0	− 0·4	0·2
Paper	228·3	219	1·0	0·9	− 4·1	− 0·5	1·7
Printing and publishing	401·2	398	1·8	1·7	− 0·8	− 0·1	1·0
Other manufacturing industries	339·6	376	1·5	1·6	10·7	1·3	1·9
Construction	1,538·4	1,593	6·8	6·9	3·5	0·4	1·1
Services	11,734·1	12,467	51·7	53·9	6·2	0·8	1·3
Gas, electricity and water	410·6	402	1·8	1·7	− 2·1	− 0·3	0·6
Railways	290·1	215	1·3	0·9	−25·9	− 3·7	−3·7
Road transport	490·0	438	2·2	1·9	−10·6	− 1·4	0·0
Transport (other)	897·2	863	4·0	3·7	− 3·8	− 0·5	1·1
Retail distribution	1,979·9	1,999	8·7	8·6	1·0	0·1	1·9
Distribution less retail	804·8	830	3·5	3·6	3·1	0·4	1·0
Insurance, banking, finance, professional and scientific services less education, medical and dental	1,086·3	1,179	4·8	5·1	8·5	1·0	2·5
Miscellaneous services, less catering and motor repairers	1,110·2	1,090	4·9	4·7	− 1·8	− 0·2	0·9
Catering, hotels, etc.	574·1	551	2·5	2·4	− 4·0	− 0·5	−0·9
Motor repairers	419·9	462	1·9	2·0	10·0	1·2	3·1
Education	1,307·8	1,706	5·8	7·4	30·4	3·4	5·0
Medical and dental	965·3	1,165	4·3	5·0	20·7	2·4	3·0
Government: national	581·9	626	2·8	2·7	7·6	0·9	−0·3
Government: local	818·0	941	3·8	4·1	15·3	1·8	0·7

* Figures may not add to totals due to roundings.

Source: Department of Employment and Productivity.

Great Britain—males: employees in employment 1968-76* TABLE 8B.2

Description	'000		%		% change	% change per annum	
	1968	1976	1968	1976	1968-76	1968-76	1952-68
Total	**14,150·8**	**14,349**	**100·0**	**100·6**	**1·4**	**0·2**	**0·3**
Primary	800·3	428	5·7	3·0	−46·5	− 7·5	−3·9
Agriculture, forestry and fishing	335·7	196	2·4	1·4	−41·6	− 6·5	−4·1
Coal-mining	409·6	172	2·9	1·2	−58·0	−10·3	−3·9
Mining and quarrying (other)	54·5	60	0·4	0·4	9·5	1·1	−2·1
Manufacturing	5,794·9	6,009	41·0	41·9	3·7	0·5	0·4
Food, drink and tobacco	446·9	463	3·2	3·2	3·6	0·4	−0·1
Chemicals and allied industries	359·1	352	2·5	2·5	− 2·0	− 0·3	−0·2
Iron and steel, tubes, castings, etc.	390·1	342	2·8	2·4	−12·3	− 1·6	−0·2
Light metals, copper, brass, etc.	111·5	130	0·8	0·9	16·6	1·9	−0·6
Shipbuilding and mechanical engineering	1,263·3	1,368	8·9	9·5	8·1	1·0	0·4
Electrical engineering	534·1	576	3·8	4·0	6·2	1·0	2·3
Vehicles less aircraft	469·1	523	3·5	3·6	6·9	0·6	−0·4
Aircraft	206·9	231	1·5	1·6	11·6	1·4	1·5
Metal goods not elsewhere specified	373·3	414	2·6	2·9	10·9	1·3	1·3
Textiles	340·6	324	2·4	2·3	− 4·9	− 0·6	−0·6
Leather, clothing and footwear	156·4	142	1·1	1·0	− 9·2	− 1·2	−1·7
Bricks, pottery, glass, cement, etc.	262·5	254	1·9	1·8	− 3·2	− 0·4	0·3
Timber, furniture, etc.	237·7	234	1·7	1·6	− 1·6	− 0·2	0·2
Paper	145·2	159	1·0	1·1	9·5	1·1	2·3
Printing and publishing	271·2	259	1·9	1·6	− 4·5	− 0·6	1·2
Other manufacturing industries	207·0	236	1·5	1·7	15·0	1·8	2·1
Construction	1,446·6	1,511	10·2	10·5	4·4	0·5	0·9
Services	6,106·6	6,401	43·2	44·6	4·6	0·6	0·6
Gas, electricity and water	353·2	348	2·5	2·2	− 1·5	− 0·2	0·3
Railways	267·4	179	1·9	1·2	−33·1	− 4·9	−3·7
Road transport	427·6	401	3·0	2·8	− 6·2	− 0·8	0·1
Transport (other)	712·1	673	5·0	4·7	− 5·5	− 0·7	0·9
Retail distribution	702·5	755	5·0	5·3	7·5	0·9	0·7
Distribution less retail	531·6	502	3·8	3·6	− 5·6	− 0·7	0·8
Insurance, banking, finance, professional and scientific services less education, medical and dental	597·0	654	4·2	4·6	9·5	1·1	2·1
Miscellaneous services, less catering and motor repairers	382·1	405	2·7	2·8	6·0	0·7	2·1
Catering, hotels, etc.	203·0	227	1·4	1·6	11·8	1·4	0·9
Motor repairers	330·7	369	2·3	2·6	11·6	1·4	2·4
Education	407·5	535	2·9	3·7	31·3	3·5	4·4
Medical and dental	231·9	276	1·6	1·9	19·0	2·2	2·1
Government: national	370·9	381	2·6	2·7	2·7	0·3	−0·9
Government: local	591·1	696	4·2	4·9	17·7	2·1	0·6

* Figures may not add to totals due to roundings.

Source: Department of Employment and Productivity.

Great Britain—females: employees in employment 1968-76* TABLE 8B.3

Description	'000		%		% change	% change per annum	
	1968	1976	1968	1976	1968-76	1968-76	1952-68
Total	**8,494·5**	**8,796**	**100·0**	**100·0**	**3·5**	**0·4**	**1·2**
Primary	98·6	58	1·2	0·6	−41·2	− 6·4	−1·2
Agriculture, forestry and fishing	77·9	45	0·9	0·5	−42·2	− 6·6	−1·6
Coal-mining	15·4	11	0·2	0·1	−28·6	− 4·1	0·5
Mining and quarrying (other)	5·3	2	0·1	0·0	−62·3	−11·5	1·0
Manufacturing	2,679·0	2,590	31·5	29·4	− 3·3	− 0·4	−0·1
Food, drink and tobacco	337·2	339	4·0	3·9	0·5	0·1	0·0
Chemicals and allied industries	136·2	135	1·6	1·5	− 0·9	− 0·1	−0·1
Iron and steel, tubes, castings, etc.	44·6	40	0·5	0·5	−10·3	−1·4	−0·5
Light metals, copper, brass, etc.	27·2	26	0·3	0·3	2·9	0·4	−1·7
Shipbuilding and mechanical engineering	261·7	276	3·3	3·1	− 2·0	−0·3	1·4
Electrical engineering	341·7	385	4·0	4·4	12·7	1·5	2·4
Vehicles less aircraft	74·2	76	0·9	0·9	2·4	0·3	−1·5
Aircraft	35·9	33	0·4	0·4	− 8·1	−1·0	1·2
Metal goods not elsewhere specified	187·6	204	2·2	2·3	8·7	1·1	0·3
Textiles	346·6	283	4·1	3·2	−18·3	−2·5	−2·6
Leather, clothing and footwear	387·8	338	4·6	3·8	−12·8	−1·7	−1·1
Bricks, pottery, glass, cement, etc.	74·4	63	0·9	0·7	−15·3	−2·0	−0·6
Timber, furniture, etc.	58·2	53	0·7	0·6	− 6·9	−1·2	0·1
Paper	83·1	60	1·0	0·7	−27·6	−4·0	0·6
Printing and publishing	130·0	139	1·5	1·6	6·9	0·8	0·7
Other manufacturing industries	132·6	138	1·6	1·6	4·1	0·6	1·6
Construction	91·6	82	1·1	0·9	−10·5	−1·4	4·6
Services	5,625·3	6,066	66·2	69·0	7·8	0·9	2·0
Gas, electricity and water	57·4	54	0·7	0·6	− 5·9	−0·8	2·7
Railways	22·7	36	0·3	0·4	58·6	5·9	−3·4
Road transport	62·4	37	0·7	0·4	−40·7	−6·4	−0·6
Transport (other)	185·1	190	2·2	2·2	2·6	0·3	1·8
Retail distribution	1,277·4	1,244	15·0	14·1	− 2·6	−0·3	2·6
Distribution less retail	273·0	328	3·2	3·7	20·1	2·3	1·4
Insurance, banking, finance, professional and scientific services less education, medical and dental	489·3	525	5·8	6·0	7·3	0·9	2·9
Miscellaneous services, less catering and motor repairers	728·1	685	8·6	7·8	− 5·9	−0·8	0·3
Catering, hotels, etc.	371·1	324	4·4	3·7	−12·7	−1·7	−1·7
Motor repairers	69·2	93	1·0	1·1	4·3	0·5	6·5
Education	900·3	1,171	10·6	13·3	30·1	3·3	5·2
Medical and dental	733·4	889	8·6	10·1	21·2	2·4	3·4
Government: national	211·0	245	2·5	2·8	16·1	1·9	1·0
Government: local	224·9	245	2·6	2·8	8·9	1·1	1·0

* Figures may not add to totals due to roundings.

Source: Department of Employment and Productivity.

Study Area—total: employees in employment 1968-76*

TABLE 8B.4

Description	'000		%		% change	Differentiel†	% change per annum	
	1968	1976	1968	1976	1968–76‡		1968-78‡	1952-68
Total	**623·8**	**689·0**	**188·0**	**180·8**	**18·6**	**8·4**	**1·3**	**0·8**
Primary	17·2	10·7	2·8	1·8	37·8	8·1	− 5·8	−2·5
Agriculture, forestry and fishing	12·1	7·7	1·9	1·1	36·4	5·3	− 5·5	−2·2
Coal-mining	2·6	0·8	0·4	0·1	−76·9	−19·9	−18·7	−8·3
Mining and quarrying (other)	2·5	2·4	0·4	0·3	− 4·0	− 7·2	− 0·5	−0·9
Manufacturing	252·8	261·2	40·6	40·8	11·2	9·7	1·3	0·9
Food, drink and tobacco	35·8	37·3	5·7	5·4	4·2	1·9	0·5	0·4
Chemicals and allied industries	10·6	13·5	1·7	2·0	27·4	29·1	3·1	−1·6
Iron and steel, tubes, castings, etc.	18·3	19·4	2·9	2·8	6·0	18·1	0·7	2·2
Light metals, copper, brass, etc.	6·1	7·4	1·0	1·1	21·3	7·4	2·4	−2·2
Shipbuilding and mechanical engineering	51·4	59·7	8·3	8·7	16·1	9·6	1·9	2·4
Electrical engineering	12·8	15·5	2·0	2·2	23·0	13·0	2·8	2·2
Vehicles less aircraft	10·7	11·2	1·7	1·6	4·7	− 1·6	0·6	−1·5
Aircraft§	31·8	35·0	5·1	5·1	10·1	1·4	1·2	0·5
Metal goods not elsewhere specified	9·2	11·6	1·5	1·7	26·1	15·9	2·9	3·8
Textiles	10·2	11·8	1·6	1·7	15·7	27·4	1·8	1·6
Leather, clothing and footwear	9·3	8·5	1·5	1·2	− 8·6	3·2	− 1·1	−0·2
Bricks, pottery, glass, cement, etc.	5·1	6·3	0·8	0·8	3·9	9·8	0·5	0·0
Timber, furniture, etc.	8·6	8·1	1·4	1·2	− 5·8	− 2·8	− 0·8	−0·8
Paper, Printing and publishing	26·9	29·2	4·3	4·2	8·6	10·6	1·0	1·2
Other manufacturing industries	8·1	7·7	1·0	1·1	26·2	15·5	3·0	1·1
Construction	42·4	46·7	6·8	6·8	10·1	8·6	1·2	1·0
Services	310·5	350·8	49·8	50·9	12·9	8·7	1·6	1·2
Gas, electricity and water	16·8	17·7	2·7	2·4	6·6	5·7	0·8	1·9
Railways	8·9	6·2	1·4	0·9	−30·3	− 4·4	− 4·4	−4·9
Road transport	14·5	15·2	2·3	2·2	4·8	15·4	0·7	0·4
Transport (other)	11·4	11·0	1·8	1·6	− 3·5	0·3	− 0·5	−1·1
Retail distribution	49·6	53·5	8·0	7·8	7·9	6·9	1·0	2·0
Distribution less retail	19·8	23·0	3·1	3·3	17·3	14·2	2·0	−0·0
Insurance, banking, finance, professional and scientific services less education, medical and dental	23·6	27·6	3·8	4·0	16·9	8·4	2·0	2·9
Miscellaneous services, less catering and motor repairers	28·3	27·9	4·5	4·0	− 1·4	0·4	− 0·2	0·4
Catering, hotels, etc.	14·0	13·1	2·2	1·9	− 6·4	− 2·4	− 0·8	−2·0
Motor repairers	13·7	16·6	2·2	2·4	21·2	11·2	2·4	2·4
Education	45·3	58·3	7·3	8·5	28·7	− 1·7	3·2	5·2
Medical and dental	35·2	47·3	5·6	6·9	34·4	13·7	3·8	3·5
Government: national	7·1	9·5	1·1	1·4	33·8	26·2	3·7	−3·3
Government: local	22·8	23·7	3·7	3·4	3·9	−11·4	0·5	0·6

* Figures may not add to totals due to roundings.

† The differential is obtained by subtracting the percentage change in Great Britain over 1968-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-68 are based on unrounded figures.

§ The range of employment growth assumptions is wide (±10 000) depending on the success of the aircraft industry and the amount of Government support for it. We have assumed a growth of around 3,000 jobs.

Source: Department of Employment and Productivity.

Study Area—males: employees in employment 1968-76*

TABLE 8B.5

Description	'000		%		% change	Differential†	% change per annum	
	1968	1976	1968	1976	1968-76‡		1968-76‡	1952-68
Total	399·3	433·7	100·0	100·0	8·6	7·2	− 1·9	0·5
Primary	14·5	9·1	3·6	2·1	−37·2	9·3	− 5·7	−4·1
Agriculture, forestry and fishing	9·7	6·2	2·4	1·4	−36·1	5·5	− 5·4	−2·8
Coal-mining	2·5	0·6	0·6	0·1	−76·0	−18·0	−16·3	−8·4
Mining and quarrying (other)	2·2	2·3	0·6	0·5	4·5	− 5·0	0·6	−1·3
Manufacturing	190·0	211·4	47·6	48·7	11·3	7·6	1·3	1·1
Food, drink and tobacco	20·5	21·3	5·1	4·9	3·9	0·3	0·5	0·5
Chemicals and allied industries	8·8	10·7	2·2	2·5	22·4	36·4	2·5	−0·9
Iron and steel, tubes, castings, etc.	16·9	17·5	4·2	4·1	5·3	17·6	0·7	2·3
Light metals, copper, bress, etc.	5·5	6·5	1·4	1·5	18·2	1·6	2·1	−2·0
Shipbuilding and mechenical engineering	42·3	49·5	10·6	11·4	17·0	8·9	2·0	2·4
Electrical engineering	5·3	9·8	2·1	2·3	18·1	9·9	2·1	2·8
Vehicles less aircraft	9·1	9·6	2·3	2·2	5·5	− 1·4	0·7	−1·8
Aircreft	28·5	31·2	7·1	7·2	9·5	− 2·1	1·1	0·7
Metal goods not elsewhere specified	6·2	8·0	1·6	1·8	29·0	18·1	3·2	4·4
Textiles	7·8	9·2	1·9	2·1	21·1	26·0	2·4	2·8
Leather, clothing and footwear	3·3	3·4	0·8	0·8	3·0	12·2	0·4	0·0
Bricks, pottery, glass, cement, etc.	4·4	4·6	1·1	1·1	4·5	7·7	0·5	0·1
Timber, furniture, etc.	7·0	6·3	1·8	1·5	−10·0	− 8·4	− 1·3	−0·8
Paper Printing and publishing	18·4	19·4	4·6	4·5	5·4	5·0	0·7	1·8
Other manufacturing industries	3·2	4·1	0·8	0·9	28·1	13·1	3·1	−0·4
Construction	40·1	44·5	10·0	10·3	11·0	6·6	1·3	0·8
Services	154·8	188·7	38·8	38·9	9·0	4·2	1·1	0·4
Gas, electricity and water	14·2	15·0	3·6	3·5	5·6	7·1	0·7	1·7
Railways	5·3	5·7	2·1	1·3	−31·3	1·8	− 4·8	−5·0
Road transport	12·5	13·5	3·2	3·1	6·3	12·5	0·8	0·6
Transport (other)	5·6	7·9	2·1	1·8	− 7·1	1·8	− 0·9	−1·8
Retail distribution	17·2	18·7	4·3	4·3	8·7	1·2	1·1	1·0
Distribution less retail	13·2	14·8	3·3	3·4	12·1	17·7	1·4	−0·3
Insurance, benking, finance, professional and scientific services less education, medical and dental	12·3	13·4	3·1	3·1	8·9	− 0·6	1·1	2·0
Miscelleneous services, less catering and motor repairers	8·0	8·6	2·0	2·0	7·5	1·5	0·9	1·5
Catering, hotels, etc.	4·0	3·5	1·0	0·9	− 5·0	−18·5	− 0·6	0·2
Motor repairers	11·0	13·2	2·8	3·0	20·0	5·4	2·3	1·7
Education	14·8	19·4	3·7	4·5	32·9	1·6	3·6	4·6
Medical and dental	5·1	10·3	2·0	2·4	27·2	8·2	3·1	2·1
Government: national	4·8	6·0	1·2	1·4	25·0	22·3	2·8	1·5
Government: local	17·8	18·3	4·5	4·2	2·8	−14·9	0·3	0·0

* Figures may not add to totals due to roundings.

† The differential is obtained by subtracting the percentage change in Great Britain over 1968-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-68 are based on unrounded figures.

Source: Department of Employment and Productivity.

Study Area—females: employees in employment 1968-76*

TABLE 8B.6

Description	'000		%		% change	Differential†	% change per annum	
	1968	1976	1968	1976	1966-76‡		1968-76‡	1952-68
Total	**223·7**	**255·5**	**100·0**	**100·0**	**14·2**	**10·7**	**1·7**	**1·5**
Primary	2·7	1·6	1·2	0·6	−40·7	0·8	−6·3	0·7
Agriculture, forestry and fishing	2·4	1·5	1·1	0·6	−37·5	4·7	−5·7	1·0
Coal-mining	0·1	0·0	0·0	0·0	n.a.	28·8	n.a.	4·2
Mining and quarrying (other)	0·2	0·1	0·1	0·0	−50·0	12·3	−6·3	2·7
Manufacturing	62·9	69·8	26·1	27·3	11·0	14·3	1·3	0·3
Food, drink and tobacco	15·2	16·0	6·8	6·2	5·3	4·8	0·6	0·1
Chemicals and allied industries	2·0	2·8	0·9	1·1	40·0	40·9	4·3	−3·9
Iron and steel, tubes, castings, etc.	1·8	1·6	0·7	0·6	6·7	17·0	0·8	2·0
Light metals, copper, brass, etc.	0·5	0·9	0·2	0·4	80·0	77·1	7·8	−8·3
Shipbuilding and mechanical engineering	9·1	10·2	4·1	4·0	12·1	14·1	1·4	2·4
Electrical engineering	4·4	6·7	2·0	2·2	29·5	16·6	3·3	1·6
Vehicles less aircraft	1·6	1·6	0·7	0·6	0·0	− 2·4	0·0	−0·7
Aircraft	3·3	3·8	1·5	1·5	15·2	23·3	1·8	−0·9
Metal goods not elsewhere specified	2·9	3·6	1·3	1·4	24·1	15·4	2·7	2·7
Textiles	2·6	2·6	1·2	1·0	0·0	18·3	0·0	−1·1
Leather, clothing and footwear	6·0	5·1	2·7	2·0	−15·0	− 2·2	−2·0	−0·3
Bricks, pottery, glass, cement, etc.	0·7	0·7	0·3	0·3	0·0	15·3	0·0	−0·4
Timber, furniture, etc.	1·8	1·6	0·7	0·7	12·5	21·4	1·5	0·1
Paper, Printing and publishing	8·8	9·8	3·8	3·8	14·0	20·8	1·6	0·1
Other manufacturing industries	2·9	3·8	1·3	1·4	24·1	20·0	2·7	3·4
Construction	2·3	2·2	1·0	0·9	− 4·3	8·2	−0·6	5·3
Services	155·8	181·9	69·8	71·2	16·8	9·0	2·0	2·0
Gas, electricity and water	2·5	2·7	1·1	1·1	8·0	13·9	1·0	3·7
Railways	0·6	0·5	0·3	0·2	−16·7	−75·3	−2·3	−1·8
Road transport	1·7	1·8	0·8	0·6	− 5·9	34·6	−0·8	−0·4
Transport (other)	2·9	3·1	1·3	1·2	6·9	4·3	0·8	1·5
Retail distribution	32·3	34·8	14·4	13·6	7·7	10·3	0·9	2·6
Distribution less retail	6·4	8·2	2·9	3·2	28·1	8·0	3·1	0·6
Insurance, banking, finance, professional and scientific services less education, medical and dental	11·2	14·2	5·0	5·6	26·8	19·5	2·9	3·9
Miscellaneous services, less catering and motor repairers	20·3	19·3	9·1	7·6	− 4·9	1·0	−0·6	0·0
Catering, hotels, etc.	10·0	9·3	4·5	3·6	− 7·0	5·7	−0·9	−6·3
Motor repairers	2·7	3·4	1·2	1·3	25·9	21·8	2·9	5·2
Education	30·6	38·9	13·7	15·2	27·1	− 3·0	3·0	5·5
Medical and dental	27·1	37·0	12·1	14·5	36·5	15·3	4·0	4·0
Government: national	2·3	3·5	1·0	1·4	52·2	38·1	5·4	−4·9
Government: local	5·1	5·4	2·3	2·1	5·9	− 3·0	0·7	0·5

* Figures may not add to totals due to roundings. Numbers of employees in employment less than 50 are shown as 0·0

† The differential is obtained by subtracting the percentage change in Great Britain over 1968-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-68 are based on unrounded figures.

Source: Department of Employment and Productivity.

Bristol-Bath—total: employees in employment 1968-76*

TABLE 8B.7

Description	'000		%		% change 1968-76‡	Differential†	% change per annum	
	1968	1976	1968	1976			1968-76‡	1952-68
Total	339·5	373·7	100·0	100·9	10·1	7·9	1·2	8·9
Primary	5·9	3·9	1·7	1·0	−33·9	12·0	−5·0	−3·6
Agriculture, forestry and fishing	3·8	2·5	1·1	0·7	−34·2	7·6	−5·1	−2·2
Coal-mining	0·9	0·0	0·3	0·0	n.a.	57·0	n.a.	−7·6
Mining and quarrying (other)	1·2	1·4	0·4	0·4	16·7	13·8	1·9	−2·3
Manufacturing	129·7	140·0	38·2	37·6	7·9	8·4	0·9	0·6
Food, drink and tobacco	25·8	26·4	7·8	7·1	2·3	0·0	0·3	0·4
Chemicals and allied industries	4·3	4·6	1·3	1·2	7·0	8·7	0·8	−1·7
Iron and steel, tubes, castings, etc.	0·5	0·8	0·1	0·2	60·0	72·1	6·1	−0·3
Light metals, copper, brass, etc.	2·6	3·1	0·8	0·6	19·2	5·8	2·2	−1·1
Shipbuilding and mechanical engineering	17·3	18·5	5·1	5·0	6·9	0·6	0·6	−0·1
Electrical engineering	6·1	8·6	1·8	2·3	41·0	31·0	4·3	3·8
Vehicles lass aircraft	4·0	4·1	1·2	1·1	2·5	− 3·8	0·3	−3·1
Aircraft	25·9	29·0	7·6	7·8	12·0	3·3	1·4	3·0
Metal goods not elsewhere specified	4·2	5·5	1·2	1·5	31·0	20·8	3·4	4·9
Textiles	1·4	1·3	0·4	0·6	− 7·1	4·8	−1·0	−1·3
Leather, clothing and footwear	7·4	6·9	2·2	1·8	− 8·8	5·0	−0·9	0·0
Bricks, pottery, glass, cement, etc.	2·4	2·1	0·7	0·6	−12·5	− 6·6	−1·6	−1·0
Timber, furniture, etc.	4·7	4·2	1·4	1·1	−10·6	− 7·6	−1·4	−1·1
Paper, Printing and publishing	21·2	22·5	6·3	6·0	8·6	7·8	0·7	0·7
Other manufacturing industries	2·0	2·4	0·6	0·6	20·0	9·3	2·4	−1·9
Construction	25·1	27·5	7·4	7·4	9·8	8·1	1·1	1·9
Services	178·7	202·3	52·6	54·1	13·2	7·0	1·6	1·3
Gas, electricity and water	9·7	10·4	2·9	2·8	7·2	9·3	0·9	2·0
Railways	5·4	4·0	1·6	1·1	−25·9	0·0	−3·6	−3·1
Road transport	8·1	9·0	2·4	2·4	11·1	21·7	1·4	0·2
Transport (other)	7·6	7·1	2·2	1·9	− 6·6	− 2·8	−0·8	−1·1
Retail distribution	28·9	33·5	8·5	9·0	15·9	14·9	1·8	2·3
Distribution less retail	14·0	16·3	4·1	4·4	16·4	13·3	1·9	0·0
Insurance, banking, finance, professional and scientific services less education, medical and dental	14·7	17·0	4·3	4·5	15·8	7·1	1·8	2·5
Miscellaneous services, less catering and motor repairers	17·8	18·5	5·2	5·0	3·9	5·7	0·4	1·3
Catering, hotels, etc.	7·9	7·5	2·3	2·0	− 5·1	− 1·1	−0·7	−1·1
Motor repairers	7·8	8·6	2·2	2·3	13·2	3·2	1·6	0·9
Education	24·1	31·0	7·1	8·3	28·6	− 1·8	3·2	5·8
Medical and dental	21·1	27·9	6·2	7·5	32·2	11·5	3·6	3·4
Government: national	1·9	2·0	0·6	0·5	5·3	− 2·3	0·7	−7·0
Government: local	9·7	9·5	2·9	2·5	− 2·1	−17·4	−0·3	−0·2

* Figures may not add to totals due to roundings. Numbers of employees in employment lass then 50 are shown as 0·0.

† The differential is obtained by subtracting the percentage change in Great Britain over 1968-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-68 are based on unrounded figures.

Source: Department of Employment and Productivity.

Bristol-Bath—males: employees in employment 1968-76*

TABLE 8B.8

Description	'000		%		% change	Differential†	% change per annum	
	1968	1976	1968	1976	1968-76‡		1968-76‡	1952-68
Total	**214·6**	**230·8**	**100·0**	**100·0**	**7·5**	**6·1**	**0·9**	**0·6**
Primary	4·6	3·2	2·2	1·4	−30·4	16·1	−4·4	−4·4
Agriculture, forestry and fishing	2·6	1·9	1·2	0·8	−26·9	14·7	−3·8	−3·4
Coal-mining	0·9	0·0	0·4	0·0	n.a.	58·0	n.a.	−7·8
Mining and quarrying (other)	1·1	1·3	0·5	0·6	18·2	8·7	2·1	−2·6
Manufacturing	95·8	102·3	44·7	44·3	6·8	3·1	0·8	0·8
Food, drink and tobacco	14·7	14·7	6·8	6·4	0·0	− 3·6	0·0	0·8
Chemicals and allied industries	3·6	3·8	1·7	1·6	5·6	7·6	0·7	−0·8
Iron and steel, tubes, castings, etc.	0·5	0·7	0·2	0·3	40·0	52·3	4·3	−0·0
Light metals, copper, brass, etc.	2·4	2·7	1·1	1·2	12·5	− 4·1	1·5	−1·0
Shipbuilding and mechanical engineering	15·1	16·0	7·0	6·9	6·0	− 2·1	0·7	−0·1
Electrical engineering	4·2	5·3	1·9	2·3	26·2	18·0	3·0	4·0
Vehicles less aircraft	3·5	3·7	1·6	1·6	− 5·7	− 1·2	0·7	−3·2
Aircraft	23·6	26·2	11·0	11·4	11·0	− 0·6	1·4	3·3
Metal goods not elsewhere specified	3·2	4·0	1·5	1·7	25·0	14·1	2·9	5·5
Textiles	0·9	0·8	0·4	0·3	−11·1	− 8·2	−1·5	−0·8
Leather, clothing and footwear	2·9	3·0	1·4	1·3	3·4	12·6	0·4	0·0
Bricks, pottery, glass, cement, etc.	1·9	1·7	0·9	0·7	−10·5	− 7·3	−1·4	−1·1
Timber, furniture, etc.	3·9	3·3	1·8	1·4	−15·4	−13·8	−2·1	−1·3
Paper Printing and publishing	14·4	15·0	6·7	8·5	4·2	3·8	0·5	1·3
Other manufacturing industries	1·2	1·4	0·6	0·8	16·7	1·7	1·9	−3·2
Construction	23·7	26·0	11·0	11·3	9·7	5·3	1·1	1·7
Services	90·4	99·3	42·1	43·0	9·8	6·0	1·1	0·5
Gas, electricity and water	7·9	8·3	3·7	3·6	5·1	6·8	0·7	1·5
Railways	4·9	3·8	2·3	1·6	−26·5	8·8	−3·8	−3·5
Road transport	7·3	8·1	3·4	3·5	11·0	17·2	1·3	0·3
Transport (other)	5·8	5·3	2·7	2·3	− 8·8	− 3·1	−1·1	−1·7
Retail distribution	10·2	12·0	4·8	5·2	17·6	10·1	2·0	1·5
Distribution less retail	9·3	10·0	4·4	4·3	7·5	13·1	0·9	−0·4
Insurance, banking, finance, professional and scientific services less education, medical and dental	7·8	8·5	3·6	3·7	9·0	− 0·8	1·0	1·8
Miscellaneous services, less catering and motor repairers	5·6	6·4	2·6	2·8	14·3	3·3	1·7	2·8
Catering, hotels, etc.	2·5	2·5	1·2	1·1	0·0	−11·8	0·0	1·0
Motor repairers	6·3	6·9	2·9	3·0	9·6	− 2·1	1·1	0·5
Education	8·7	12·0	4·0	5·2	37·9	6·6	4·1	8·0
Medical and dental	5·1	6·9	2·4	3·0	35·3	16·3	3·9	2·0
Goverment: national	1·4	1·3	0·6	0·6	− 7·1	− 9·8	−1·0	−5·0
Goverment: local	7·8	7·5	3·6	3·2	0·0	−17·7	0·0	−0·2

* Figures may not add to totals due to roundings. Numbers of employees in employment less than 50 are shown as 0·0.

† The differential is obtained by subtracting the percentage change in Great Britain over 1968-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-68 are based on unrounded figures.

Source: Department of Employment and Productivity.

Bristol-Bath—females: employees in employment 1968-76*

TABLE 8B.9

Description	'000		%		% change 1968-76‡	Differential†	% change per annum	
	1968	1976	1968	1976			1968-76‡	1952-68
Total	**124·8**	**142·9**	**100·0**	**100·0**	**14·4**	**10·9**	**1·7**	**1·5**
Primary	1·3	0·7	1·0	0·5	−46·2	− 5·0	−7·4	2·7
Agriculture, forestry and fishing	1·1	0·6	0·9	0·4	−45·5	− 3·3	−7·3	2·9
Coal-mining	0·0	0·0	0·0	0·0	0·0	28·6	0·0	4·1
Mining and quarrying (other)	0·1	0·1	0·1	0·1	0·0	62·3	0·0	0·8
Manufacturing	33·9	37·7	27·1	26·4	11·2	14·5	1·4	0·0
Food, drink and tobacco	11·1	11·7	8·9	8·2	5·4	4·9	0·7	0·2
Chemicals and allied industries	0·7	0·8	0·5	0·6	14·3	15·2	1·7	−4·8
Iron and steel, tubes, castings, etc.	0·0	0·1	0·0	0·1	n.a.	10·3	n.a.	−4·9
Light metals, copper, brass, etc.	0·2	0·4	0·2	0·3	100·0	97·1	9·1	−1·9
Shipbuilding and mechanical engineering	2·2	2·5	1·8	1·7	13·6	15·6	1·6	0·1
Electrical engineering	1·8	3·3	1·5	2·3	73·7	61·0	7·1	3·4
Vehicles less aircraft	0·5	0·4	0·4	0·3	−20·0	−22·4	−2·7	−2·7
Aircraft	2·4	2·8	1·9	2·0	16·7	24·8	1·9	0·6
Metal goods not elsewhere specified	1·0	1·5	0·8	1·0	50·0	41·8	5·2	3·3
Textiles	0·5	0·5	0·4	0·3	0·0	18·8	0·0	−2·5
Leather, clothing and footwear	4·5	3·9	3·6	2·7	−13·3	− 0·5	−1·6	−0·0
Bricks, pottery, glass, cement, etc.	0·5	0·4	0·4	0·3	−20·0	− 4·7	−2·7	−0·6
Timber, furniture, etc.	0·8	0·9	0·7	0·6	12·5	21·4	1·5	−0·3
Paper Printing and publishing	6·6	7·5	5·4	5·2	10·3	16·9	1·2	−0·4
Other manufacturing industries	0·7	1·0	0·8	0·7	42·9	38·8	4·5	1·5
Construction	1·4	1·5	1·2	1·0	7·1	17·6	0·9	6·5
Services	88·3	103·0	70·7	72·1	16·6	6·9	1·9	2·2
Gas, electricity and water	1·8	2·1	1·4	1·5	16·7	22·6	1·9	4·7
Railways	0·5	0·4	0·4	0·3	−20·0	−78·6	−2·7	1·6
Road transport	0·8	0·9	0·6	0·6	12·5	53·2	1·5	−0·5
Transport (other)	1·8	1·8	1·4	1·3	0·0	− 2·6	0·0	1·4
Retail distribution	18·7	21·5	14·9	15·0	15·0	17·8	1·7	2·8
Distribution less retail	4·7	6·3	3·7	4·4	34·0	14·0	3·8	0·9
Insurance, banking, finance, professional and scientific services less education, medical and dental	7·0	8·5	5·0	5·9	21·4	14·1	2·5	3·4
Miscellaneous services, less catering and motor repairers	12·2	12·1	9·7	8·5	− 0·8	5·1	−0·1	0·8
Catering, hotels, etc.	5·4	5·0	4·3	3·5	− 7·4	5·3	−1·0	−1·8
Motor repairers	1·3	1·7	1·1	1·2	30·8	26·5	3·4	3·4
Education	16·5	19·0	12·4	13·3	22·6	− 7·5	2·6	5·7
Medical and dental	16·0	21·0	12·8	14·7	31·3	10·1	3·5	3·9
Government national	0·6	0·7	0·4	0·5	16·7	0·8	1·9	−9·9
Government local	2·2	2·0	1·8	1·4	− 9·1	−18·0	−1·2	−0·1

* Figures may not add to totals due to roundings. Numbers of employees in employment less than 50 are shown as 0·0.

† The differential is obtained by subtracting the percentage change in Great Britain over 1968-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-68 are based on unrounded figures

Source: Department of Employment and Productivity.

North Gloucestershire—total: employees in employment 1968-76*

TABLE 8B.10

Description	'000		%		% change 1968-76‡	Differential†	% change per annum	
	1968	1976	1968	1976			1968-76‡	1952-68
Total	**167·8**	**183·1**	**100·0**	**100·0**	**9·1**	**6·9**	**1·1**	**0·8**
Primary	7·3	4·4	4·4	2·4	−39·7	6·2	−6·1	−3·7
Agriculture, forestry and fishing	6·3	3·8	3·8	2·1	−39·7	2·0	−6·1	−2·1
Coal-mining	0·0	0·0	0·0	0·0	0·0	57·0	0·0	−25·2
Mining and quarrying (other)	0·9	0·6	0·5	0·3	−33·3	−36·5	− 4·9	2·0
Manufacturing	69·4	80·0	41·4	43·7	15·3	13·8	1·8	1·4
Food, drink and tobacco	6·6	7·2	3·9	3·9	9·1	6·8	1·1	0·8
Chemicals and allied industries	2·5	3·4	1·5	1·9	36·0	37·7	4·0	2·9
Iron and steel, tubes, castings, etc.	1·1	1·2	0·7	0·7	9·1	21·2	1·1	− 0·9
Light metals, copper, brass, etc.	0·2	0·9	0·1	0·5	350·0	336·1	20·7	−11·4
Shipbuilding and mechanical engineering	27·9	33·0	16·6	18·0	18·3	12·0	2·1	4·5
Electrical engineering	2·8	3·6	1·7	2·0	28·6	18·6	3·2	3·6
Vehicles less aircraft	2·2	1·7	1·3	0·9	−22·7	−29·0	− 3·2	− 2·4
Aircraft	5·9	6·0	3·5	3·3	1·7	− 7·0	0·2	− 4·8
Metal goods not elsewhere specified	2·8	3·3	1·7	1·8	17·9	7·7	2·0	4·7
Textiles	4·5	5·2	2·7	2·8	15·6	27·3	1·8	3·5
Leather, clothing and footwear	0·9	0·9	0·5	0·5	0·0	11·8	0·0	− 1·6
Bricks, pottery, glass, cement, etc.	1·4	1·8	0·8	1·0	28·6	34·5	3·2	1·6
Timber, furniture, etc.	3·3	3·3	2·0	1·8	0·0	3·0	0·0	0·4
Paper	1·8	1·8	1·1	1·0	0·0	4·1	0·0	4·2
Printing and publishing	2·4	2·7	1·4	1·5	12·5	13·8	1·5	2·2
Other manufacturing industries	3·2	4·0	1·9	2·2	25·0	14·3	2·9	3·4
Construction	10·8	9·9	6·4	5·4	− 8·3	−11·8	− 1·1	−0·2
Services	80·2	88·8	47·8	48·5	10·7	4·5	1·3	1·2
Gas, electricity and water	3·6	3·3	2·1	1·8	− 8·3	− 6·2	− 1·1	1·2
Railways	1·4	0·6	0·8	0·3	−57·1	−31·2	−10·1	− 6·5
Road transport	3·4	3·6	2·0	2·0	5·9	16·6	0·7	0·4
Transport (other)	1·5	1·8	0·9	1·0	20·0	23·8	2·4	− 1·5
Retail distribution	12·8	13·0	7·6	7·1	1·6	0·6	0·2	1·4
Distribution less retail	3·1	4·6	1·8	2·5	48·4	45·3	5·1	− 0·6
Insurance, banking, finance, professional and scientific services less education, medical and dental	5·9	6·9	3·5	3·8	16·9	8·4	1·9	3·6
Miscellaneous services, less catering and motor repairers	6·2	4·5	3·7	2·5	−27·4	−25·6	− 3·9	− 2·2
Catering, hotels, etc.	3·8	3·5	2·3	1·9	− 7·9	− 3·9	− 1·0	− 3·3
Motor repairers	3·9	5·1	2·3	2·8	30·8	20·8	3·4	4·2
Education	14·2	18·0	8·5	9·8	26·8	− 3·6	3·0	5·4
Medical and dental	7·6	9·7	4·5	5·3	27·6	6·9	3·1	3·6
Government: national	4·5	4·8	2·7	2·6	6·7	− 0·9	0·8	−0·7
Government: local	8·5	9·4	5·1	5·1	10·6	− 4·7	1·3	3·4

* Figures may not add to totals due to roundings. Numbers of employees in employment less than 50 are shown as 0·0

† The differential is obtained by subtracting the percentage change in Great Britain over 1968-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-68 are based on unrounded figures.

Source: Department of Employment and Productivity.

North Gloucestershire—males: employees in employment 1968-76*

TABLE 8B.11

Description	'000		%		% change	Diff-	% change per annum	
	1968	1976	1968	1976	1968-76‡	erential†	1968-76‡	1952-68
Total	**107·3**	**116·3**	**100·0**	**100·8**	**8·4**	**7·0**	**1·8**	**0·5**
Primary	6·2	3·7	5·8	3·2	−40·3	8·2	− 6·2	− 4·2
Agriculture, forestry and fishing	5·3	3·1	5·0	2·7	−41·5	0·1	− 6·5	− 2·4
Coal-mining	0·0	0·0	0·0	0·0	0·0	58·0	0·0	25·6
Mining and quarrying (other)	0·8	0·6	0·8	0·5	−25·0	−34·5	−3·6	1·6
Manufacturing	52·1	61·4	48·5	52·8	17·9	14·2	2·0	1·5
Food, drink and tobacco	4·5	5·0	4·2	4·3	11·1	7·5	1·4	1·5
Chemicals and allied industries	1·9	2·9	1·8	2·5	52·6	54·8	5·4	3·7
Iron and steel, tubes, castings, etc.	0·9	1·1	0·9	0·9	22·2	34·5	2·6	− 1·3
Light metals, copper, brass, etc.	0·2	0·8	0·2	0·7	300·0	283·4	18·9	−10·7
Shipbuilding and mechanical engineering	22·4	27·0	20·8	23·2	20·5	12·4	2·4	4·8
Electrical engineering	1·9	2·8	1·8	2·2	36·8	28·6	4·0	2·9
Vehicles less aircraft	1·9	1·5	1·8	1·3	−21·1	−28·0	− 3·0	− 2·3
Aircraft	4·9	5·0	4·8	4·3	2·0	− 9·6	0·3	− 6·0
Metal goods not elsewhere specified	1·8	2·2	1·7	1·9	22·2	11·3	2·6	5·8
Textiles	3·1	4·0	2·9	3·4	29·0	33·9	3·3	7·0
Leather, clothing and footwear	0·3	0·3	0·3	0·3	0·0	8·2	0·0	0·0
Bricks, pottery, glass, cement, etc.	1·3	1·7	1·2	1·5	30·8	34·0	3·4	1·7
Timber, furniture, etc.	2·6	2·5	2·4	2·1	− 3·8	− 2·2	− 0·5	0·4
Paper	1·2	1·2	1·2	1·0	0·0	− 9·5	0·0	5·0
Printing and publishing	1·6	1·6	1·5	1·4	0·0	4·5	0·0	2·6
Other manufacturing industries	1·5	2·0	1·4	1·7	33·3	18·3	3·7	2·1
Construction	10·3	9·5	9·6	8·2	− 7·8	−12·2	− 1·0	− 0·4
Services	38·8	41·7	36·1	35·9	7·5	2·7	0·9	0·7
Gas, electricity and water	3·2	3·0	2·9	2·6	− 6·2	− 4·7	− 0·8	1·1
Railways	1·3	0·6	1·2	0·5	−53·8	−20·7	− 9·2	− 8·5
Road transport	3·0	3·3	2·8	2·8	10·0	15·2	1·2	0·4
Transport (other)	0·9	1·1	0·9	0·9	22·2	27·7	2·6	− 2·5
Retail distribution	4·9	4·8	4·6	4·1	− 2·0	− 9·5	− 0·3	0·6
Distribution less retail	1·9	3·4	1·8	2·9	78·9	84·5	7·5	− 1·6
Insurance, banking, finance, professional and scientific services less education, medical and dental	3·1	3·0	2·9	2·6	− 3·2	−12·7	− 0·4	2·7
Miscellaneous services, less catering and motor repairers	1·4	0·9	1·3	0·8	−35·7	−41·7	− 5·4	− 1·4
Catering, hotels, etc.	1·0	0·6	0·9	0·5	−40·0	−51·8	− 8·2	− 1·8
Motor repairers	3·0	4·1	2·8	3·5	36·7	25·1	4·0	3·6
Education	4·0	5·0	3·8	4·3	25·0	− 6·3	2·9	4·2
Medical and dental	1·4	1·7	1·3	1·5	21·4	2·4	2·5	2·7
Government: national	3·1	3·2	2·8	2·8	3·2	0·6	0·4	− 0·5
Government: local	6·6	7·0	6·2	6·0	6·1	−11·8	0·8	3·3

* Figures may not add to totals due to roundings. Numbers of employees in employment less than 50 are shown as 0·0.

† The differential is obtained by subtracting the percentage change in Great Britain over 1968-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-68 are based on unrounded figures.

Source: Department of Employment and Productivity.

North Gloucestershire—females: employees in employment 1968-76*

TABLE 8B.12

Description	'000		%		% change	Differential†	% change per annum	
	1968	1976	1968	1976	1968-76‡		1968-76‡	1952-68
Total	**60·5**	**86·8**	**100·0**	**100·0**	**10·4**	**8·9**	**1·2**	**1·4**
Primary	1·1	0·7	1·8	1·0	−36·4	4·8	− 5·5	− 0·6
Agriculture, forestry and fishing	1·0	0·7	1·7	1·0	−30·0	12·2	− 4·3	0·0
Coal-mining	0·0	0·0	0·0	0·0	0·0	26·6	0·0	−20·6
Mining and quarrying (other)	0·1	0·0	0·1	0·0	n.a.	62·3	n.a.	10·1
Manufacturing	17·4	16·6	28·7	27·6	6·9	10·2	0·6	1·1
Food, drink and tobacco	2·1	2·2	3·6	3·3	4·8	4·3	0·6	− 0·5
Chemicals and allied industries	0·7	0·5	1·1	0·7	−28·6	−27·7	− 4·1	1·0
Iron and steel, tubes, castings, etc.	0·1	0·1	0·2	0·1	0·0	10·3	0·0	3·9
Light metals, copper, brass, etc.	0·0	0·1	0·1	0·1	n.a.	− 2·8	n.a.	−13·6
Shipbuilding and mechanical engineering	5·5	6·0	9·2	9·0	9·1	11·1	1·1	3·4
Electrical engineering	0·9	1·0	1·5	1·6	11·1	− 1·6	1·4	5·4
Vehicles less aircraft	0·2	0·2	0·4	0·3	0·0	− 2·4	0·0	− 3·4
Aircraft	1·0	1·0	1·6	1·5	0·0	8·1	0·0	− 3·6
Metal goods not elsewhere specified	1·0	1·1	1·7	1·6	10·0	1·3	1·2	3·2
Textiles	1·3	1·2	2·2	1·6	− 7·7	10·6	− 1·0	− 0·9
Leather, clothing and footwear	0·6	0·6	1·1	0·9	0·0	12·8	0·0	− 2·2
Bricks, pottery, glass, cement, etc.	0·1	0·1	0·1	0·1	0·0	15·3	0·0	0·1
Timber, furniture, etc.	0·7	0·8	1·1	1·2	14·3	23·2	1·7	0·5
Paper	0·5	0·6	0·9	0·9	20·0	47·6	2·4	2·5
Printing and publishing	0·8	1·1	1·3	1·6	37·6	30·6	4·1	1·4
Other manufacturing industries	1·7	2·0	2·7	3·0	17·6	13·5	2·0	5·0
Construction	0·6	0·4	1·0	0·6	−33·3	−22·6	− 4·9	4·2
Services	41·4	47·1	66·5	70·5	13·8	6·0	1·6	1·6
Gas, electricity and water	0·4	0·3	0·6	0·4	−25·0	−19·1	− 3·5	1·7
Railways	0·0	0·0	0·1	0·0	0·0	−56·6	0·0	− 7·5
Road transport	0·5	0·3	0·6	0·4	−40·0	0·7	− 6·2	0·6
Transport (other)	0·6	0·7	1·0	1·0	16·7	14·1	1·9	0·5
Retail distribution	7·9	8·2	13·0	12·3	3·6	6·4	0·4	2·0
Distribution less retail	1·1	1·2	1·9	1·6	9·1	−11·0	1·1	1·4
Insurance, banking, finance, professional and scientific services less education, medical and dental	2·6	3·9	4·8	5·6	39·3	32·0	4·2	4·8
Miscellaneous services, less catering and motor repairers	4·6	3·6	8·0	5·4	−25·0	−19·1	− 3·5	− 2·4
Catering, hotels, etc.	2·6	2·9	4·6	4·3	3·6	16·3	0·4	− 3·7
Motor repairers	0·8	1·0	1·4	1·6	25·0	20·7	2·9	6·6
Education	10·2	13·0	16·6	19·5	27·6	− 2·6	3·1	5·9
Medical and dental	6·1	6·0	10·2	12·0	31·1	9·9	3·5	3·8
Government: national	1·5	1·6	2·4	2·4	6·7	− 9·4	0·6	− 1·2
Government: local	1·8	2·4	3·1	3·6	26·3	16·4	3·0	4·1

* Figures may not add to totals due to roundings. Numbers of employees in employment less than 50 are shown as 0·0.

† The differential is obtained by subtracting the percentage change in Great Britain over 1958-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-68 are based on unrounded figures.

Source: Department of Employment and Productivity.

Monmouthshire-Ross—total: employees in employment 1968-76*

TABLE 8B.13

Description	'000		%		% change 1968-76‡	Differential†	% change per annum	
	1968	1976	1968	1976			1968-76‡	1952-68
Total	**115·7**	**132·4**	**100·0**	**100.0**	**14·4**	**12·2**	**1·7**	**0·6**
Primary	4·0	2·4	3·5	1·8	−40·0	5·9	− 6·2	− 3·3
Agriculture, forestry and fishing	2·0	1·4	1·7	1·1	−30·0	11·7	− 4·3	− 2·6
Coal-mining	1·6	0·6	1·4	0·5	−62·5	− 5·5	−11·5	− 4·3
Mining and quarrying (other)	0·3	0·4	0·3	0·3	33·3	30·1	3·7	− 1·7
Manufacturing	53·7	61·2	46·4	46·2	14·0	12·5	1·6	0·8
Food, drink and tobacco	3·4	3·7	2·9	2·8	8·8	6·5	1·0	− 0·3
Chemicals and allied industries	3·8	5·5	3·3	4·2	44·7	46·4	4·7	− 3·4
Iron and steel, tubes, castings, etc.	16·8	17·4	14·5	13·1	3·6	15·7	0·4	2·6
Light metals, copper, brass, etc.	3·2	3·4	2·8	2·6	8·3	− 7·6	0·8	− 1·7
Shipbuilding and mechanical engineering	6·1	8·2	5·3	6·2	34·4	28·1	3·8	3·0
Electrical engineering	3·7	3·3	3·2	2·5	−10·8	−20·8	− 1·4	− 0·4
Vehicles less aircraft Aircraft	4·6	5·4	4·0	4·1	17·4	10·3	2·0	1·2
Metal goods not elsewhere specified	2·2	2·8	1·9	2·1	27·3	17·1	3·1	1·2
Textiles	4·3	5·3	3·7	4·0	23·3	35·0	2·7	1·0
Leather, clothing and footwear	1·0	0·7	0·9	0·5	−30·0	−18·2	− 4·3	−0·4
Bricks, pottery, glass, cement, etc.	1·4	1·4	1·2	1·1	0·0	5·9	0·0	0·8
Timber, furniture, etc.	0·6	0·6	0·5	0·5	0·0	3·0	0·0	− 1·7
Paper	1·1	1·7	1·0	1·3	54·5	58·6	5·6	12·4
Printing and publishing	0·6	0·5	0·5	0·4	−16·7	−15·9	− 2·3	− 0·8
Other manufacturing industries	0·9	1·3	0·8	1·0	44·4	33·7	4·7	3·1
Construction	6·4	9·3	6·5	7·0	45·3	41·8	4·8	0·3
Services	51·6	59·5	44·8	44·9	15·3	9·1	1·8	0·8
Gas, electricity and water	3·4	4·0	2·9	3·0	17·6	19·7	2·0	2·6
Railways	2·1	1·6	1·8	1·2	−23·8	2·1	− 3·3	− 6·9
Road transport	2·9	2·6	2·5	2·0	−10·3	0·3	− 1·4	1·2
Transport (other)	2·3	2·1	2·0	1·6	− 8·7	− 4·9	− 1·1	− 0·8
Retail distribution	7·9	7·0	6·8	5·3	−11·4	−12·4	− 1·5	2·0
Distribution less retail	2·5	2·1	2·2	1·6	−16·0	−19·1	− 2·1	0·3
Insurance, banking, finance, professional and scientific services less education, medical and dental	3·0	3·7	2·6	2·8	23·3	14·8	2·7	3·1
Miscellaneous services, less catering and motor repairers	4·3	4·9	3·7	3·7	14·0	15·8	1·6	1·6
Catering, hotels, etc.	2·3	2·1	2·0	1·6	− 8·7	− 4·7	− 1·1	−2·4
Motor repairers	2·2	2·9	1·9	2·2	31·8	21·8	3·5	5·1
Education	6·9	9·3	6·0	7·0	34·8	4·4	3·8	3·2
Medical and dental	6·5	9·7	5·6	7·3	49·2	28·5	6·1	4·0
Government: national	0·6	2·7	0·5	2·0	350·0	342·4	20·7	− 2·6
Government: local	4·7	4·8	4·1	3·6	2·1	−13·2	0·3	− 0·6

* Figures may not add to totals due to roundings

† The differential is obtained by subtracting the percentage change in Great Britain over 1968-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-68 are based on unrounded figures.

Source: Department of Employment and Productivity.

Monmouthshire-Ross—males: employees in employment 1968-76*

TABLE 8B.14

Description	'000		%		% change 1968-76‡	Differential†	% change per annum 1968-76‡	% change per annum 1952-68
	1968	1976	1968	1976				
Total	77·4	85·6	100·0	100·0	11·9	10·5	1·4	0·2
Primary	3·6	2·2	4·7	2·5	−38·9	7·6	6·0	− 3·4
Agriculture, forestry and fishing	1·7	1·2	2·3	1·3	−29·4	12·2	4·3	− 2·8
Coal-mining	1·6	0·6	2·1	0·7	−62·5	− 4·5	11·5	− 4·3
Mining and quarrying (other)	0·3	0·4	0·4	0·8	33·3	22·8	3·7	− 1·8
Manufacturing	42·0	47·7	54·3	55·1	13·8	9·9	1·8	1·0
Food, drink and tobacco	1·4	1·8	1·8	1·8	14·3	10·7	1·7	− 1·4
Chemicals and allied industries	3·1	4·0	4·0	4·8	29·0	31·0	3·3	− 2·7
Iron, steel, tubes, castings, etc.	15·4	18·0	20·0	18·5	3·9	18·2	0·5	2·8
Light metals, copper, brass, etc.	3·0	3·0	3·9	3·5	0·0	−16·6	0·0	− 1·5
Shipbuilding and mechanical engineering	4·8	6·5	6·2	7·5	35·4	27·3	3·9	2·9
Electrical engineering	2·2	1·9	2·8	2·2	−13·6	21·8	1·8	− 0·1
Vehicles less aircraft Aircraft	3·8	4·4	4·9	5·1	15·8	7·5	1·9	1·0
Metal goods not elsewhere specified	1·2	1·8	1·6	2·1	50·0	39·1	5·2	1·1
Textiles	3·8	4·4	4·7	5·1	22·2	27·1	2·5	1·3
Leather, clothing and footwear	0·1	0·1	0·2	0·1	0·0	9·2	0·0	− 1·7
Bricks, pottery, glass, cement, etc.	1·2	1·2	1·6	1·4	0·0	3·2	0·0	0·9
Timber, furniture, etc.	0·5	0·5	0·7	0·6	0·0	1·6	0·0	− 2·0
Paper	0·8	1·3	1·0	1·5	62·5	83·0	6·3	12·8
Printing and publishing	0·4	0·3	0·5	0·3	−25·0	−20·5	− 3·5	− 0·9
Other manufacturing industries	0·4	0·7	0·5	0·8	75·0	60·0	7·2	6·8
Construction	6·1	9·0	7·9	10·4	47·5	43·1	5·0	0·1
Services	25·6	27·7	33·0	32·0	8·2	3·4	1·0	− 0·8
Gas, electricity and water	3·1	3·7	4·0	4·3	19·4	20·9	2·2	2·8
Railways	2·1	1·5	2·7	1·7	−28·6	4·5	− 4·1	− 8·8
Road transport	2·5	2·2	3·3	2·5	−12·0	− 5·8	− 1·6	1·5
Transport (other)	1·7	1·5	2·3	1·7	−11·8	− 8·3	− 1·5	− 1·8
Retail distribution	2·1	1·9	2·7	2·2	− 9·5	−17·0	− 1·2	0·1
Distribution less retail	1·9	1·4	2·5	1·6	−26·3	−20·7	− 3·7	1·2
Insurance, banking, finance, professional and scientific services less education, medical and dental	1·5	1·9	1·9	2·2	26·7	17·2	3·0	1·9
Miscellaneous services, less catering and motor repairers	1·0	1·3	1·2	1·5	30·0	24·0	3·3	1·0
Catering, hotels, etc.	0·5	0·7	0·7	0·8	40·0	28·2	4·3	0·7
Motor repairers	1·7	2·2	2·2	2·5	29·4	17·8	3·3	4·4
Education	1·9	2·4	2·5	2·8	26·3	− 5·0	3·0	1·0
Medical and dental	1·5	1·7	2·0	2·0	13·3	− 5·7	1·6	2·0
Government: national	0·4	1·5	0·5	1·7	275·0	272·3	18·0	− 3·9
Government: local	3·7	3·8	4·7	4·4	2·7	−15·0	0·3	0·0

* Figures may not add to totals due to roundings.

† The differential is obtained by subtracting the percentage change in Great Britain over 1968-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-68 are based on unrounded figures.

Source: Department of Employment and Productivity.

Monmouthshire-Ross—females: employees in employment 1968-76*

TABLE 8B.15

Description	'000		%		% change 1966-76‡	Diff-erential†	% chenge per ennum	
	1968	1976	1968	1976			1968-76‡	1952-66
Total	**38·3**	**45·8**	**100·0**	**100·0**	**19·6**	**16·1**	**2·3**	**1·4**
Primary	0·4	0·2	0·9	0·4	−50·0	− 8·8	− 8·3	− 1·1
Agriculture, forestry end fishing	0·3	0·2	0·6	0·4	−33·3	6·9	− 4·9	− 1·1
Coal-mining	0·0	0·0	0·1	0·0	0·0	28·6	0·0	− 2·9
Mining and quarrying (other)	0·0	0·0	0·1	0·0	0·0	62·3	0·0	0·3
Manufacturing	11·6	13·5	30·4	29·5	16·4	19·7	1·9	0·2
Food, drink end tobecco	2·0	2·1	5·2	4·6	5·0	4·5	0·6	0·6
Chemicals and ellied industries	0·7	1·5	1·6	3·3	114·3	115·2	10·0	− 6·6
Iron end steel, tubes, castings, etc.	1·3	1·4	3·4	3·1	7·7	16·0	0·9	2·0
Light metals, copper, brass, etc.	0·3	0·4	0·7	0·9	33·3	30·4	3·7	− 3·5
Shipbuilding end mechanicel engineering	1·3	1·7	3·4	3·7	30·6	32·8	3·4	3·4
Electrical engineering	1·5	1·4	4·0	3·1	− 6·7	−19·4	− 0·9	− 0·8
Vehicles less aircroft Aircroft	0·6	1·0	2·1	2·2	25·0	26·0	2·9	2·2
Metal goods not elsewhere specified	0·9	1·0	2·4	2·2	0·1	2·4	1·3	1·4
Textiles	0·7	0·9	1·6	2·0	28·6	46·9	3·2	2·2
Leather, clothing end footwear	0·9	0·6	2·3	1·3	−33·3	−20·5	− 4·9	− 0·2
Bricks, pottery, gloss, cement, etc.	0·2	0·2	0·4	0·4	0·0	15·3	0·0	− 0·1
Timber, furniture, etc.	0·1	0·1	0·2	0·2	0·0	8·9	0·0	1·6
Peper	0·3	0·4	0·7	0·9	33·3	61·1	3·7	11·4
Printing end publishing	0·2	0·2	0·6	0·4	0·0	− 6·9	0·0	− 0·7
Other manufacturing industries	0·5	0·6	1·4	1·3	20·0	15·9	2·4	1·6
Construction	0·3	0·3	0·8	0·7	0·0	10·5	0·0	3·6
Services	26·0	31·6	67·9	69·4	22·3	14·5	2·6	2·1
Gas, electricity end watar	0·3	0·3	0·6	0·7	0·0	5·9	0·0	1·6
Railweys	0·1	0·1	0·1	0·2	0·0	−58·6	0·0	− 6·0
Road traneport	0·4	0·4	1·1	0·9	0·0	40·7	0·0	− 0·6
Transport (other)	0·5	0·6	1·4	1·3	20·0	17·4	2·4	3·3
Retail distribution	5·6	5·1	15·1	11·1	−12·1	− 9·5	− 1·6	3·0
Distribution less retell	0·6	0·7	1·6	1·5	16·7	− 3·4	1·9	− 2·0
Insurance, banking, finance, professional end scientific services less education, medicel end dental	1·5	1·8	3·9	3·9	20·0	12·7	2·4	4·5
Miscellaneous services, less catering and motor repairers	3·3	3·6	6·7	7·9	9·1	15·0	1·1	1·7
Cetering, hotels, etc.	1·8	1·4	4·7	3·1	−22·2	− 9·5	− 3·1	− 3·1
Motor repairers	0·5	0·7	1·3	1·5	40·0	35·7	4·3	8·3
Educetion	5·0	6·9	13·0	15·1	36·0	7·9	4·2	4·2
Medical end dental	5·0	6·0	13·0	17·5	60·0	36·6	6·1	4·8
Government: national	0·3	1·2	0·7	2·6	300·0	263·9	16·9	− 0·1
Government: locel	1·0	1·0	2·6	2·2	0·0	− 6·9	0·0	− 2·6

* Figures may not add to totals due to roundings. Numbere of employees in employment less then 50 are shown as 0·0.

† The differential is obtained by subtracting tha percentage change in Great Britain over 1968-76 from the corresponding local percentage change.

‡ Based on figures rounded to the nearest thousand whereas those for 1952-66 are based on unrounded figures.

Source : Department of Employment and Productivity.

9 PROSPECTS FOR SEVERNSIDE AFTER 1976

The national background

9.1. In Chepters 7 and 8 we have considered the economic structure and development of Severnside in recent years and the prospects up to 1976. We turn now to the outlook for the years beyond 1976.

9.2. The prospacts for Severnside must be set in the context of wider regional and national policies. We have assumed that netional policies throughout the 1970s and 1980s will be directed to achieving a faster rete of growth end that vigorous regional policies to correct the existing imbelances in employment end activity between the regions will be an essential part of the overall national strategy. In the 1970s the continuing contraction of the traditional industries in the older industrial arees will mean thet speciel measures will continue to be necessary to ettract new employment opportunities to the Development and Intermediate Areas and thet infrestructure conducive to economic growth will have to be providad. At the same time employment will be needed to match the movement of population into the new end expending towns which have alreedy been approved.

9.3. In both these cases a considerable part of the employment needed will have to be promoted by moving industrial projects well away from the existing locations of the enterprises concerned end most of these projects ere, on past experience, likely to be in the manufacturing sector. In any one pariod only e limited number of projects cepable of being so moved is likely to come forward and this number will depend upon the economic climate, the extent to which expension is not permitted in or near existing sites and the attractions of the new locations. A fester rate of economic growth should help to secure an increesed flow of mobile industriel projects, as well as stimulating the expansion of existing activity in the areas needing new employment. But in the earlier 1970s a constraint on national expansion may be set by a slight reduction in the labour force, although in the second half of the decade as the working population begins agein to increase, this constraint should be lessened. Over the period as a whole, however, the supply of mobile industry is unlikely to be large enough to do more than barely cover the needs of the Development and Intermediete Areas and existing new and expanding towns, although the position should begin to ease in the latter part of the period as progress is made towards solving the problems of the assisted areas and es they are able to rely increasingly on self-generating growth from within thamsalves.

9.4. We have assumed that by 1981 sufficient progress will have been made in the assisted areas to anabla a re-assessment of priorities to be made. Even then, there are likely still to be arees needing essistanca and thus some mobile industry from elsewhere. Their total needs ere, however, likely to be appreciably less than today's assisted arees. Although efforts to encourage industry to move from ereas with an undue pressure on resources should elso have hed some effect by 1981, we heve also essumed that there will still be erees of the country so congestad as to provide an ergument for encoureging their further population and industrial growth to move elsewhere. We have essumed that this means that a mechanism simlar in its effects to the present industrial davelopment certificate control system will still ba in operation in the 1980s and 1990s and will be used with the necessary stringency to encourage a distribution of industry in line with the policy needs of the time. Under these conditions we believe there will continue to be a substantiel flow of steerable industrial projects, and that efter 1981 part of this flow could be used to support plenned population developments in areas such es Severnside.

9.5. The civilian population of Great Britain in 1991 is currently forecest at 61·4 million (Table 9a), so thet over the 15 years 1976 to 1991 the population should increase by 5·5 million or 9·8 per cent.[31] Out of this, the population aged 15+ is calculated to increase by almost 4 million or 9·4 per cent (Table 9b). Forecasts of populetion are always hazerdous because of uncertainty about future trends in birth retes. Forecasts of the 15+ population for e 20-yeer period ere much more reliabla, and the forecast for this age group in 1991 is reasonably secure, subject to any unforesaen fluctuations in international migretion.

9.6. Of the 5·5 million increase, current projections for Great Britain suggest thet as many as

(31) Source: Mid-1968-besed Total Population Projection by the Government Actuary, March 1970, with adjustments to e civilian population basis by the Office of Population Censuses and Surveys.

Table 9a

Study Area and Great Britain: civilian population 1968-2001 *†

'000

Area	Civilian population 1968	Natural change	Balance mainly net migration	Civilian population 1978	Natural change	Balance mainly net migration	Civilian population 1991	Natural change	Balance mainly net migration	Civilian population 2001
Great Britain*	53,460	2,580	−110	55,950			61,440			64,500
Study Area	**1,660**	**100**	**50**	**1,810**	**180**	**100**	**2,100**	**140**	**80**	**2,320**
Bristol-Bath	900	50	20	980	90	40	1,120	70	30	1,220
North Gloucestershire	460	30	20	500	50	30	580	40	20	650
Monmouthshire-Ross	300	20	10	330	40	30	400	30	20	450

* A breakdown of the total change into 'Natural change' and 'Balance mainly net migration' is not available for Great Britain for the periods 1976-1991 and 1991-2001.
† Figures rounded to the nearest 10,000.

Table 9b

Study Area and Great Britain: civilian population aged 15 and over 1976 and 1991*

'000

Area	Total		Males		Females	
	1976	1991	1976	1991	1976	1991
Great Britain	42,080	46,020	20,090	22,190	21,990	23,830
Study Area	**1,350**	**1,570**	**650**	**750**	**710**	**820**
Bristol-Bath	730	840	350	400	390	440
North Gloucestershire	380	430	180	210	200	230
Monmouthshire-Ross	240	290	120	140	120	150

* Figures rounded to the nearest 10,000.
Source: Office of Population Censuses and Surveys and the Central Unit for Environmental Planning.

4·3 million will (on existing Government policies and existing demographic and economic trends) accrue to the population in the already densely populated areas.[32] We have assumed that it is some part of the expected increase in population in these areas that might be encouraged to move to areas like Severnside.

9.7. The current forecast of Great Britain's population for 2001 is 64·5 million, an increase over the 1968 figure of 20 per cent. This forecast is even more hazardous, of course, than that for 1991.

9.8. Estimating national employment changes over a period 20 or more years ahead is far more difficult even than forecasting the total population. The pace of technological change is, if anything, likely to quicken. New skills and professions will have to be acquired so that the occupational and industrial structure of the country may be very different from what it is today. It seems safe to assume only the continuance of two general trends:

i a continuing decline in the numbers employed in the primary industries of agriculture and coal-mining;

ii a continuing rise in the proportion of the population employed in service, as opposed to manufacturing, industry.

9.9. There can be no assurance as to the pace even of these general trends. However, the proportion of the working population in primary industry will already have fallen so far by 1976 that different assumptions about the rate of its further decline make little difference to the outcome for policy. On the other hand, if the growth in the proportion of the working population in service employment since the early 1950s of 3 percentage points every 8 years were to continue at the same rate over the next 20 years (which would not be out of line with the experience of the USA over several decades) then the service and construction sector would account for roughly two-thirds of total employment by 1991. The growth of service employment in Britain has been, however, largely a growth in female employment, which to some extent has been in response to an increase in the number of women seeking employment. The pace of the shift to service employment in this country may, therefore, not be maintained when the proportion of women seeking paid employment ceases to rise so fast. Table 9c sets out, in terms of employees in employment, the distribution of the labour force between major sectors in Great Britain in 1991 which we have assumed for working purposes. (See Annex 9B at the end of this Chapter.)

(32) Defined as the South East region and the Sub-divisions of Mid-Lancashire, North East Lancashire, South Lancashire, Merseyside, Manchester, Fylde, South Cheshire, West Yorkshire, Yorkshire Coalfield, South Yorkshire, Coventry Belt, West Midlands Conurbation, Central Area of the West Midlands, North Staffordshire, Notts-Derby, Leicester, Northampton, Industrial North East, Industrial South Wales, Glasgow, Falkirk/Stirling and Edinburgh, which constitute 80 per cent of the population of Great Britain.

Table 9c

Great Britain: employees in employment 1976 and 1991 *

'000

	Total		Males		Females	
	1976	1991	1976	1991	1976	1991
Total	**23,150**	**25,500**	**14,350**	**15,500**	**8,800**	**10,000**
Primary	490	260	430	230	60	30
Manufacturing	6,600	9,000	6,010	6,500	2,590	2,500
Construction	1,590	1,740	1,510	1,670	60	70
Services	12,470	14,500	6,400	7,100	6,070	7,400

* Figures rounded to the nearest 10,000.

Projections for Severnside

9.10. Estimates prepared for the Unit by the Office of Population Censuses and Surveys imply that if present trends continue, the civilian population of the Area should grow from 1·7 million in 1968 to about 2·1 million in 1991 and 2·3 million in 2001 (see Annex 9A at the end of this chapter). Table 9a on page 148 gives the detailed projections. This forecast implies that Severnside's population will continue to grow (as a result of inward migration) rather faster than the population of Great Britain generally. The percentage rate of growth 1976-1991 is estimated at 16 per cent compared with 10 per cent nationally. Forecasts of the population aged 15 and over for Great Britain and Severnside are shown in Table 9b.

Prospects for trend growth

9.11. We prepared employee in employment projections for Severnside to 1991 by extrapolating our expected trends in the period 1968-76 of the ratio of Severnside to Great Britain employees in employment and then applying these ratios to the figures in Table 9c to give the figures in Table 9d. (See Annex 9B.) Similar trend projections for each sub-area up to 1991 have been calculated. These are set out and considered in paras. 9.12-9.21.

Bristol-Bath

9.12. Applying the method in paragraph 9.11 to the employment figures for the Bristol-Bath sub-area, we obtained the figures in Table 9e.

9.13. In the Bristol-Bath area a major source of uncertainty is the future of the aircraft industry, which is not predictable by normal economic methods. Nevertheless, much of any unemployment that might occur if the Concorde project does not achieve commercial viability should be absorbed as other engineering industry takes advantage of highly skilled workers released from aircraft production and the availability of industrial premises. While unemployment might be expected to disappear quite quickly, there would inevitably be a check to employment growth for about five years. Growth would, we believe, eventually be resumed at much the same pace as in the past, but the projections in Table 9e would be reached with a five-year time lag. Apart from this major uncertainty the long-term prospects for Bristol-Bath seem good, although much depends on the success of particular firms and industries in the area. Economic activities in this area are so diverse that there is a good prospect that failures in particular directions will be made good in others. The substantial growth of service employment (an

Table 9d

Study Area: employees in employment 1976-2001 *

'000

	Total			Males			Females		
	1976	1991	2001	1976	1991	2001	1976	1991	2001
Total	**690**	**860**	**980**	**430**	**520**	**580**	**260**	**340**	**400**
Primary	10	10	10	10	10	10	**	**	**
Manufacturing	260	340	360	210	260	290	70	80	90
Construction	50	60	60	50	50	60	**	**	**
Services	350	460	530	170	200	230	160	250	300

* Figures rounded to the nearest 10,000.
** Less than 5,000.

Table 9e

Bristol-Bath: employees in employment 1976 and 1991 *

'000

	Total		Males		Females	
	1976	1991	1976	1991	1976	1991
Total	370	460	230	270	140	190
Primary	**	**	**	**	**	**
Manufacturing	140	160	100	120	40	50
Construction	30	30	30	30	**	**
Services	200	260	100	120	100	140

* Figures rounded to the nearest 10,000.
** Less than 5,000.

averege of 4,000 a year) does not seem out of the question bearing in mind the area's importance as an administrative, office and cultural centre and its likely growth as a distributive centre in view of its position in relation to the national roed pattern.

North Gloucestershire

9.14. Application of the seme method of projection gives the figures in Table 9f for North Gloucestershire.

9.15. It is possible that the underlying trend of growth that we have assumed for North Gloucestershire will in the longer term prove over-cautious, end that the pace of growth in manufacturing employment could be even greater. In particuler, it may be thet in due course the area's links with the West Midlands Industrial complex will increase the expansion of manufacturing employment towards the growth rates that that area has enjoyed in the past. It is also possible that this sub-area's particular strength in very modern classes of light engineering industry may give it special advantages, should these lines of industry prove to be the high growth sectors, nationally, in the leter 1970s and 1980s. Since, unlike Bristol-Bath, this sub-area does not contain a regional centre, service employment may not grow quite so vigorously, as the estimates show.

Monmouthshire-Ross

9.16. Table 9g gives the projected employment growth in this sub-area to 1991. The Newport-Cwmbran-Pontypool area lies astride the main gateway to South Wales. In the normal course it would, therefore, be ettractive to firme interested in South Wales. The economy of this part of the sub-area is therefore intimately bound up with the economic future of South Wales in two main waye. If South Walee prospers the Newport area is likely to particlpate fully in that

Table 9f

North Gloucestershire: employees in employment 1976 and 1991 *

'000

	Total		Males		Females	
	1976	1991	1976	1991	1976	1991
Total	180	230	120	140	70	90
Primary	**	**	**	**	**	**
Manufacturing	80	100	60	80	20	20
Construction	10	10	10	10	**	**
Services	90	110	40	50	50	60

* Figures rounded to the nearest 10,000.
** Less than 5,000.

Table 9g

Monmouthshire-Ross: employees in employment 1976 and 1991 *

'000

	Total		Males		Females	
	1976	1991	1976	1991	1976	1991
Total	130	170	90	110	50	60
Primary	**	**	**	**	**	**
Manufacturing	60	80	50	60	10	20
Construction	10	10	10	10	**	**
Services	60	80	30	40	30	50

* Figures rounded to the nearest 10,000.
** Less than 5,000.

prosperity. If, however, steps heve still to be taken to encourage industry to go to the western part of South Wales this is likely to work to some extent to Newport's disadvantage. By the 1980s, however, we believe the former possibility is the more likely end that the long-term prospects of this area are good, so that manufacturing employment may rise even more strongly than Teble 9g suggests. The projected growth in service employment is, however, very high—greater in percentage terms even than the growth projected for Bristol-Bath. This may be an over-estimate, although recent experience suggests this is an attractive area for offices. Part of the recent employment growth in this area has been based on the efforts of the Cwmbran New Town Corporation. If these efforts are brought to an end in the 1970s growth rates will be so much the less, so thet in effect the trend growth figures of Table 9g presuppose a continuation of plenned growth in this sub-area.

Overall comparison of labour supply and demand

9.17. In the previous chapter activity retes were projected to 1976 and on that basis labour supply and demand forecasts were compared. It would be possible to project in the seme way past activity rates forward to 1991, but the data base for such projections is much more limited then for projections of employees in employment and so we did not feel justified in producing an independent estimate of labour supply to be compared explicitly with an estimate of labour demand. Thus the comparison of labour supply and demand is, we believe, better done implicitly by an examination of activity rates derived from estimates of employees in employment and estimates of the adult (15+) population. Accordingly, activity rates for 1991 have been derived in this way.

9.18. The Great Britain figures in Table 9h cannot, however, be directly compared with the Severnside figures because, as explained in footnote 19 on page 69, there is under-recording of employment on Severnside. To allow for this the present Severnside figures have to be increased by about 5 percentage points. The sama adjustment needs to be made to any calculations of future activity rates based on projections of employment. If this is done the activity rates generally on Severnside by 1991 would become substantially higher than for Great Britain as a whole. This indicates a high level of economic activity on Severnside, although such a wide difference in activity rates is unlikely in practice to develop—see para. 9.20. The projected female activity rate for North Gloucestershire is out of line with the projections for the other two sub-areas—again a discrepancy which is unlikely to hold in practice.

Table 9h

Study Area and Great Britain: projected activity rates 1991*

%

	1991	
	Males	Females
Great Britain	71	42
Study Area	**71**	**42**
Bristol-Bath	69	44
North Gloucestershire	69	38
Monmouthshire-Ross	77	43

* Based on figures which have been rounded to the nearest 10,000.

Summary-projections to 1991

9.19. Thus we have found no circumstences in the seperete sub-areas, if the necessary labour is available, which would lead us to consider that employment at about the levels given in Tables 9d to 9g is impossible of achievement. Moreover Severnside es a whole has been an area to which people have come in the past attracted by the pleasant physical surroundings es well as by the work opportunities. Indeed this factor of people wanting to live in an aree can be quite important in an area's economic growth as well es the factors of the growth of local industries' demand for workers. With careful planning Severnside should continue to be an attrective erea to live in and this consideration has much reinforced our belief in the continuation of these upward economic trends.

9.20. Furthermore we have shown (para 9.18) that if these employment levels were to be achieved they would lead to high activity rates on the basis of the trend population projections given in Table 9a. If in fact this began to happen, either even more people would be drawn into Severnside than we have assumed by the high demand for labour there or the local industrialists would reduce their labour needs. We cannot say which is the more likely to happen, but this reinforces our belief that the population projections in Table 9a will be achieved—if not exactly in 1991 then very probably within a few years on either side of that date.

9.21. These economic and employment projections have been based very largely on trends in the period 1951-68 end they contain therefore the implicit assumption that the sub-areas of Severnside will be treated by the Government's regional policy measures broadly es they were during that period. It seems to us unlikely that these measures will be operated more strictly in the 1980s. We conclude therefore that without new measures to stimulate growth in the Area inward migration is likely to continue at broadly past trends and population growth will be broadly on the lines indicated in Table 9a. Even however if we are wrong about the continuation of past migration trends and migration levels were to be less in future than they have been in the past, population levels up to thosa given for 1991 would still be reached some time in the 1990s, unless deliberate steps are taken to restrain economic growth in this Area, thus forcing some of the Area's own natural growth in population to seek work and homes elsewhere. We think it would be wrong to hold back economic growth in this thriving area to that extent and that plans should be made so that this area could accommodate population levels of this order as a minimum. Local development plans should therefore be prepared on the assumption that as a minimum the population figures given in Table 9i will be achieved in the 1990s.

Projections to 2001

9.22. These figures are only a broad indication of what we think likely to heppen in the 1980s on Severnside. It would be even more unwise for us to attempt to say anything categorical about employment and population prospects on Severnside in the 1990s. So much will happen before then

Table 9i

Study Area: population assumptions for planning purposes assuming no new stimulus to growth*

Area	1968 '000	1981 '000	Increase 1968-81 '000	Increase 1968-81 %	1991 '000	Increase 1968-91 '000	Increase 1968-91 %
Study Area	**1,660**	**1,900**	**250**	**14**	**2,100**	**440**	**26**
Bristol-Bath	900	1,020	100	13	1,120	220	24
North Gloucestershire	460	530	100	15	580	120	27
Monmouthshire-Ross	300	350	50	18	400	100	34

* Figures rounded to the nearest 10,000.

to change the whole structure of employment that anything we said would certainly prove wrong in important particulars. Our general approach to preparing figures for 2001 is, therefore, to project forward what seems likely to happen in the 1980s and give the corresponding figures to the year 2001. If we had found reasons for considering that past migration trends would not hold in the 1980s we would have made a corresponding change in the 1990s projection. However, since we have concluded that for planning purposes it would be wise to assume that (without any major change in the Government's broad regional policies) populations calculated largely on the basis of past trends are the minimum to be planned for in this Area we think this is likely to be true also as a broad guide for the 1990s. The figures given in Table 9j are, therefore, the likely population figures, in this Area by 2001 or within a few years of that date on present policies. We are thus anticipating a more rapid growth in the population of Monmouthshire-Ross on the basis of present policies than either of the other two sub-areas and all three are expected to grow much faster than the country as a whole.

Table 9j

Study Area: likely population levels on present policies at about the year 2001*

Area	2001 '000	Increase over 1968 '000	Increase over 1968 %
Study Area	**2,320**	**660**	**40**
Bristol-Bath	1,220	320	35
North Gloucestershire	650	190	40
Monmouthshire-Ross	450	150	53

* Figures rounded to nearest 10,000.

Prospects of accelerated growth

9.23. We have so far considered prospects of growth on the basis of present policies, but we have assumed that a key element in our task was to assess the prospects of accelerating growth on Severnside by means of changes in policy and that this necessarily involves a willingness to consider such changes in favour of Severnside as would encourage more industry to move there. In view, however, of uncertainties about prospects in the 1970s—para. 9.2—we have felt it would not be right for us to contemplate such changes of policy in favour of this Area before 1981. Thus in effect the remainder of this chapter considers the prospects for stimulating a higher level of employment on Severnside during the 1980s and 1990s.

Idc policy

9.24. During the 1960s idc control was administered increasingly strictly on East Severnside and few firms moved there (para. 7.22). The first possibility to consider therefore is the effect that might be obtained by making idc's more freely available on Severnside (while assuming that in other parts of the country distribution of industry policy remained unchanged). We have tackled this hypothetical question by considering what might have happened if the policy had been administered in a completely liberal manner in the past, i.e. if idc's had been granted to all applicants, whether local firms wishing to expand or outside firms wishing to manufacture in Severnside for the first time and, in the latter case, irrespective of the places where the firms concerned were previously located. Further, we have assumed that this free availability of idc's on Severnside was widely known among firms throughout the country. This would have implied treatment for Severnside with respect to idc's at least as good as that given to Development Areas—but there would have been no financial inducements—and better than that given to new towns. There cannot be any doubt that normally if idc's had been freely available to newcomers to East Severnside in the 1950s and 1960s, more would have moved in. The difficulty is to say how many.

9.25. In the conditions of the 1950s the drawing power of Severnside would have been enhanced compared with that of Development Areas, but firms based in other parts of the country were not finding it difficult at that time to obtain idc's for expansion in their own localities, so that the effects of the special treatment of Severnside which we are postulating, although important, would probably not have raised growth to a totally different order from the growth which actually

took place there. In the 1960s, when there was much more movement of industry partly as a result of the general tightness of idc policy outside Development Areas, East Severnside, if idc's had been available there to all applicants, might have represented a particularly attractive alternative for many firms refused locations nearer their base and reluctant to go to Development Areas. On the other hand, incentives to go to Development Araas were biggar than they had earlier been and investigations seem to show that incentives divide potential movers into two roughly equal groups, one which is sensitive to them and which hence locates new plants whera they will benefit, and the other which andeavours to stay as near as possible to their home bases or to some other specific locating factor. In other words, the intermediate group of firms prepared to open new plants outside their home regions but which nevertheless spurn incentives is ralatively small. However, East Severnside is not greatly distant from the West Midlands or for that matter the London area and would meet the requirements of many firms which feel the need to retain close links between new locations and old. We formed the view that it would not be unreasonable to suppose that manufacturing industry growth might have been 20-40 per cent larger had the idc control been operated with complete liberality on East Severnside during the 1950s and 1960s. This assessment subsumes the belief that the population would have grown to provide the necessary labour force but that a (net) rate of immigration higher than that implied by this rate of industrial expansion might have been difficult to achieve without the sort of special measures this report considers for the future. Monmouthshire-Ross has not been subject to a strict idc policy so that the issue we have been considering in relation to the other two sub-areas does not arise in its case. Looking to the future we have therefore taken the view that if idc's were freely available throughout Severnside to all applicants while the policy pursued in all other parts of the country remained the same as it is at present, the rate of growth in male manufacturing employment in East Severnside would be about 30 per cent above the established past trend.

Other inducements

9.26. So far in effect we have considered the issue only in tarms of industrialists' propensities to seek expanding production facilities in a new area, with no change in the Government's attitude other than a relaxation of the idc control. There remains the even more intangible question of the psychological effects of an announced Government intention deliberately to promote a Severnside location as a major centre of accelerated growth: we assume that this would mean vigorous efforts to encourage industrialists to move thera (similar to those undertaken by new town corporations), the provision of the infrastructure necessary to prime and to support the growth objective and measures to encourage migrants to move to the area in step with the increase in job opportunities. Indeed we are here assuming all possible efforts to accelerate economic growth *short* of giving financial inducement to industry.

9.27. On West Severnside we have already shown in our trend calculations (para. 9.16) that the growth postulated in this area assumes new town-type treatment similar to that received by Cwmbran. In the particular circumstances of this sub-area, including the fact that the sites for major developmant within easy reach of the present industrial areas are limited, we hava concluded that there are few prospects of accelerating growth any more except in remote areas such as Raglan or in axceptional circumstances like the establishment of a MIDA on the Wentlooge Level.

9.28. In East Severnside, however, given its substantial growth even without such stimuli, its favourable national location and its physical attractiveness, the prospects are that an all out effort could achieve a much accelerated inward flow of jobs. To put a figure on this acceleration is very difficult, but we have had regard to the experience of new and expanding towns in the past, to the population growth projected for some of the latest new towns and to estimates of the total supply of mobile industry in the 1980s. The simplest statistical approach is to apply a uniform multiple to the rate of growth likely in the area without new inducements. This would not in all circumstances yield the right result, since accelerated growth is not necessarily related in this simple way to trend growth. However when dealing with growth on East Severnside in those areas we have selected which are close to existing major towns, the growing industries and labour forces of those towns are likely to be a substantial factor in attracting new industries. The results, moreover, when related to the physical possibilities in these areas, do fit what we intuitively feel, as a result of our long study of this Area, to be the potentialities of these particular sites.

9.29. We have made a very broad guess that on this basis, in addition to 30 per cent more incoming male manufacturing jobs due to idc relaxation, there could be up to a further 70 per cent increase in male manufacturing jobs due to designation as a place for major growth, with accompanying policies to stimulate growth, giving a 100 per cent increase overall. Increased manufacturing employment would produce consequential incraases in the construction and service sectors. This extra induced growth in the service sector would be naeded to provide the services demanded by the new manufacturing industry and also to provide for the needs of the new workere and their families.

9.30. We also felt it would be reasonable to aseume that the employment structure of this increased growth would be similar to that experienced by the new towns, allowing for variations due to location and other factors. Within East Severnside, the employment structure of a new town in the Bristol-Bath sub-area, where a sizeable services centre already exists, would differ from that of a new town in North Gloucestershire. Furthermore, looking ahead twenty years or so, the employment structure of new towns is likely to show a shift towards more service induetries than at present. Taking all these factore into account we decided to assume the employment structure set out in Table 9k for the increment resulting from accelerated growth.

9.31. The assumptions about accelerated growth in para. 9.29 were then applied to the trend growth figures given in Table 9e for Bristol-Bath and Table 9f for North Gloucestershire to arrive

Table 9k

East Severnside: assumed employment structure for the increment resulting from accelerated growth*

%

	Male	Female	Total
Total	**60**	**40**	**100**
Manufacturing	30	20	50
Construction	10	0	10
Services	20	20	40

* Based on figures which have been rounded to the nearest 10,000.

at the figures in Table 9l. (An account of the calculations is given in Annex 9C). The accelerated growth figures for North Gloucestershire are higher than Bristol-Bath in this table, because the increment in the trend growth of male manufacturing employment (on which the calculations are based) is also higher. Despite the smaller size of the present economic base overall in North Gloucestershire this higher growth rate seems reasonable when the greater physical planning possibilities in this area are considered. If the sites were not close to existing major towns these growth rates could not be achieved without financial incentives. They do not, therefore, apply to the early development of, for example, Dymock.

Table 9l

East Severnside: additional employees in employment from maximum accelerated growth 1981-1991-2001*

'000

Area	1981-91	1991-2001	1981-2001
Bristol-Bath	30	30	60
North Gloucestershire	45	45	90
East Severnside	75	75	150

* Figures rounded to the nearest 5,000.

Population

9.32. From the foregoing estimates of the maximum employment growth that might be feasible in the Area without financial inducements to industry, a correeponding population in the Area can be deduced. An increase in the number of jobs in an area will normally be taken up not only by migrants but also by people travelling in to work each day and either directly or indirectly by the unemployed and inactive in the area. However, we felt that the numbers travelling into East Severnside on a daily basis to take up new jobs from accelerated growth would be negligible since there are no large pools of labour sited nearby and if our assumptions about the continuation of trend growth through the 1980s hold, then the demand for labour should already be high. It is, therefore, likely that those wanting jobs in Severnside would already in the main have been catered for and so it seemed reasonable to adopt the assumption that the jobs arising from accelerated growth would be mostly filled by migrants.

9.33. The number of migrants needed to provide the necessary supply of labour was calculated on the basis of aseumptions about the activity rate and age and sex structure. Firstly, it was assumed that male migrants over the period 1981-91 would have an activity rate 4 percentage points above the national level (this is in line with current new town experience) but for the period 1991-2001 it was assumed that the rate would drop to the national level. This would mean activity rates for male migrants into Severnside of 75 per cent in the period 1981-91 and 70 per cent in the period 1991-2001. (In applying these activity rates, an allowance of one percentage point was made for the wholly unemployed.) Secondly, based on past experience of migrant flows, it was assumed that the numbers of females aged 15 and over would equal the number of males aged 15 and over. Thirdly, it was assumed that the migrants would have the same age structure as migrants entering Severnside in the 1960s. These assumptions gave the figures for the migrant population, arising from accelerated growth in employment, set out in Table 9m.

9.34. If we add the maximum possible acceleration in population growth to our estimates of growth assuming past policies for the Study Area were unaltered, we arrive at the maximum population figures. These are given in Table 9n.

Table 9m

East Severnside: population increase due to accelerated growth 1981-2001*

'000

Area	1981-91	1991-2001	1981-2001
Bristol-Bath	65	65	130
North Gloucestershire	95	105	200
East Severnside	160	170	330

* Figures rounded to the nearest 5,000.

Table 9n

Study Area: maximum population 1991 and 2001*

Area	1991 '000	Increase 1968-91 '000	Increase 1968-91 %	2001 '000	Increase 1968-2001 '000	Increase 1968-2001 %
Study Area	**2,260**	**660**	**37**	**2,650**	**990**	**60**
Bristol-Bath	1,160	260	31	1,350	450	50
North Gloucestershire	680	220	48	850	390	84
Monmouthshire-Ross	400	100	34	450	150	53

* Figures rounded to the nearest 10,000.

9.35. The maximum percentage growth figures for Monmouthshire-Ross and Bristol-Bath are almost exactly the same despite the fact that further stimulus to growth in the main industrial part of the former area is not considered practical. North Gloucestershire's maximum growth figures are well above those for the other two sub-areas. These figures are based on the assumptions that every effort ie made to attract industry and people

into the areas concerned (excapt that financial inducaments for the movement of industry are not offered) and that the population and industry are located sufficiently close to existing centres so that the growth in these centres can stimulate growth in the new areas. Similar rates of growth might be achiaved in more remote parts of the Area, but almost certainly only by offering financial inducements to industry.

Organisational problems

9.36. We have considered whether the annual rates of population growth implied by these maximum figures would raise problems of organisation, bearing in mind the particular locations where tha growth might occur, and whether other difficulties could arise.

9.37. The greatest annual accelerated growth would be in the North Gloucestershire sub-area where it would be up to 10,000 people a year during the 1980s and 1990s. To this should be added the ordinary growth of 5,000-6,000 a year. Tha total growth if concentrated in one area of expansion would ba extremely high and might give rise to administrativa, industrial and social problems. Two or three areas of expansion are, however, possible in this sub-area and, with skilful planning and timing, growth would be taking place in enough areaa simultaneously to bring the problem within raach of solution, but overall control in this sub-area would be necessary for success. The problems, both physical and industrial, of development on the west bank of the Severn would be considerable and if the maximum accelerated growth is required assistance going beyond that normally made available to new towns today would probably be necessary.

9.38. The maximum annual population growth for Bristol is again about 15,000-16,000 a year in the 1980s and 1990s, but this ia made up of more ordinary growth and less due to acceleration. Given Bristol'a axisting size and economic prospects expansion at this rate should be administratively, industrially and socially possible even if it la largely concentrated in one major expansion area. The problems should be within tha capacity of the local authorities structured as they are likely to be by that time.

9.39. For Monmouthshire-Ross we have concluded that even the 'trend' expansion rates of Tabla 9i would involve the continuation of a stimulus to growth similar to that given in the 1950s and 1960s by Cwmbran New Town. Since the main area for expansion is contiguous to Cwmbran New Town a possibla administrative arrangement would be to extend the powers of the existing Corporation for the New Town over the new araa, which should prove adequate to deal with any problems likely to arise from the rate of growth propoeed.

Conclusions

9.40. In all parts of Severnsida the ratas of growth of population and employment are already above the national average and we consider that without any major policy changes to stimulate growth in the Area this trend is likely to continue for as far ahead as it is reasonable to look. Severnside's share of the national population would rise, if these past trends continue, from 3·1 per cent in 1968 to 3·4 per cent in 1991 and 3·6 per cent by tha end of the century—a total increasa in population of 660,000. Local development plans ought to be based in future on tha expectation of growth of at least this order of magnituda.

9.41. We believe that the maximum accelerated growth which could be achieved in this Area without offering financial inducements to industry would cater for additional populations of about 160,000 by 1991 and 330,000 by 2001. The total and-century population of Severnside would then be about 1 million above the 1968 population. Such an increase would mean that, of the expected population increase in Great Britain as a whole to the end of the century, the Study Area would be taking 9 per cent. The percentage increase in population over tha 1968 level would be about 50 per cent for Bristol-Bath and Monmouthshira-Ross and 84 per cent for North Gloucastershire, as against a national population increase of 19 per cent.

Annex 9A

Note on population projections

9A.1. 1968-based civilian population projections for Great Britain to the end of the century were provided by the Office of Population Censuses and Surveys.

9A.2. Civilian population projections for Severnside for 1976 and 1981 were specially calculated for the Unit by the Office of Population Censuses and Surveys. These projections are 1966-based but allow for 1968 boundaries. The migration assumptions were that the absolute level of net migration over the ten-year period 1966-76 should be two-thirds of the quantity of net migration recorded over the fifteen-year period 1951-66 (see para. 8.7) and for 1976-81 one-half of the 1966-76 figures. The assumptions were, therefore, as follows:

	net migration '000	
	1966-76	1976-81
Bristol-Bath	25·0	12·5
North Gloucestershire	20·0	10·0
Monmouthshire-Ross	14·0	7·0

The natural growth assumptions were in line with the national assumptions used in preparing the 1968-based figures (para. 9A.1).

9A.3. Estimates of the civilian population of Severnside in 1991 and 2001 were obtained by assuming a compound interest rate of growth based on the growth over 1968-81. This total growth was then broken down into the two components of natural increase and migration for the purposes of Table 2a on the assumption that the ratio of natural increase to migration would remain constant, based on the average value of this ratio over 1968-76 and 1976-81.

Annex 9B

Note on employee in employment projections

9B.1. The aim of these projections is to extend the 1976 employee in employment figures given in Chapter 8 to 1991 and again on a consistant basis to 2001. As in the forecasts to 1976, the projections for Severnside are related to the Great Britain projections.

9B.2. Although there are Great Britain population projections to the end of the century provided by the Government Actuary's Department and Office of Population Censuses and Surveys, there are no central Government projections for employees in employment in Great Britain beyond 1972. However, projections of the working population in Great Britain to 1981 are available and these appeared in the March 1979 volume of the *Department of Employment and Productivity Gazette*.

9B.3. To obtain employee in employment projections for males and females separately for Great Britain in 1991 we worked via estimates of ratios of:

i the working population to the population aged 15+;

ii employees in employment to the working population.

9B.4. First, the working population estimates for 1976 and 1981 were changed from their 1967-base to a 1968-base by multiplying by the ratio of 1968-based to 1967-based Total Population estimates obtained from the 1969 and 1968 *Annual Abstracts of Statistics*, respectively. These base year correction factors were adjusted slightly to compensate for the fact they were based on Total Population forecasts for the years 1975 and 1980 and not 1976 and 1981 as required. Secondly, the ratio of working population to civilian population aged 15+ for 1976 and 1981 was projected to 1991 and applied to the forecast of civilian population aged 15+ in 1991 to provide an estimate of the working population in 1991.

9B.5. From the ratios of employees in employment to working population in 1966 and 1976 an estimate for this ratio in 1991 was obtained which when applied to the working population estimate for 1991 gave an estimate of employees in employment in 1991.

9B.6. This employee in employment estimate was broken down between the four major sectors: primary, manufacturing, construction and services by using past trends and estimates of the future pattern of employment in Great Britain, taking into account the factors referred to in para 9.8.

9B.7. Estimates of employees in employment in Great Britain in 2001 were obtained in a similar manner to the estimates for 1991.

9B.8. The corresponding figures for the sub-areas were obtained by projecting the appropriate ratios of employment in Severnside to Great Britain for the years 1968 and 1976 to 1981, 1991 and finally 2001.

Annex 9C

Note on the calculation of effects of accelerated growth on employees in employment

9C.1. This note explains the calculation of the figures in Table 9I.

9C.2. The basic assumption is that maximum accelerated growth could give rise to a 100 per cent increase in male manufacturing employment over expected trend growth in both Bristol-Bath and North Gloucestershire (para 9.29). Thirty jobs in male manufacturing are then assumed to give rise to 20 jobs in female manufacturing and 50 jobs in services and construction. In other words for every 30 extra male manufacturing jobs, the total increment in employment is assumed to be 100. This factor is then applied to the increase in male employment to arrive at the total employment increase.

EXAMPLE

Bristol-Bath. Male employment on trend growth rises from 110,000 in 1981 to 119,000 in 1991—an increase of 9,000.

Applying the 100 per cent factor the maximum accelerated growth increment in male employment would be 9,000 during 1981-91.

Applying the 100:30 ratio to this figure gives a 30,000 increment in total employment during 1981-91.

10 ASSESSMENT OF COSTS

Introduction

10.1. Whatever the actual size of the national growth of population by the end of the century, much additional urban development will be necessary not only to accommodate the growth itself but also to meet the demand arising from redevelopment and a continuing increase in living standards. A major part of the investment involved in growth on Severnside will therefore be required in any event. It is the balance of advantage between one location and another which is of concern in terms of the return on the resources used both for capital expenditure and in subsequent running costs. In our study of Humberside we recognised that ideally a comparison of costs and benefits at alternative locations would assist the determination of policy on major expansion.

10.2. In an attempt to make an overall appraisal of Severnside compared with other locations a very wide range of possible costs and benefits would need to be taken into account. Variations in certain capital costs can be expected to occur between one area and another, firstly because of some inherent characteristic of a location, for example topography, agricultural land quality or load-bearing capacity and secondly because of the nature of investment in infrastructure required by large-scale expansion. Variations of the first type are relatively easily identified, although in some instances their measurement involves detailed surveys which have not always proved practicable with the resources available to us. Nevertheless variations of this kind are minimised because the selection process for areas physically suitable for development can be taken to exclude those which would impose exceptional costs for construction and provision of public services. Variations of the second type may arise because of differences in the capacity of existing infrastructure, the extent to which expenditure on major items of new infrastructure has to be brought forward in time and the need for entirely new expenditure which would not otherwise be called for e.g. a complete remodelling of town centres or of urban transport systems. For these latter types of cost variation it is desirable to try to identify significant thresholds.

10.3. Such thresholds are encountered where, in order to accommodate additional population, expenditure on a particular item has to be sharply increased—for example, a new sewage treatment works, a new road link or new public transport facilities. These problems also arise during the natural growth of a town and a decision is then required whether to cross the threshold and so incur heavy capital expenditure or to meet the situation by a series of short-term and probably increasingly expensive palliatives. Average costs will rise sharply at the time a threshold is crossed and subsequently fall as the capacity of a new facility is more fully utilised. In so far as the new facility is under-utilised for any length of time it is necessary to consider the resultant reduced return in relation to the return which might have been earned by some alternative use of the resources employed. The new facility might, however, permit economies of scale both in the design of the overall system and in its operational costs, thus possibly lowering average costs in turn to below their former level. Nevertheless, where major thresholds are encountered the risk of a partial or seriously deferred use of the required additional capacity must be taken into account.

10.4. Given adequate information about Severnside and other areas it would be possible to make a comparison, in terms of a range of capital and running costs, taking account of thresholds which would be encountered in providing necessary services and facilities. Because of inevitable uncertainties in the promotion of growth in a large area an important consideration would be the extent to which development at a particular location permitted a flexible approach to planned growth or required a commitment to heavy public expenditure at the outset.

10.5. In addition consideration would have to be given to costs which might be incurred in inducing the necessary volume of new industry to move to each area and in encouraging growth in existing industry. If incentives are required in order to induce the requisite industrial growth the effects in terms of resource costs can be expected to vary between different locations. Where an area has unused labour resources there will be a gain to be offset against the cost of incentives. Where an area has no unused resources then any lag between an increased labour supply and an increased labour demand will impose a resource cost which can be ascribed to planned expansion. Furthermore, if the movement of people and firms from congested areas is not co-ordinated the vacated jobs in the congested pressure areas will be taken up and the potential benefits of reduced congestion lost.

10.6. Variations in benefits between one area and another can also be anticipated. The locational attributes of one area may be such as to permit new industry to reach operating efficiency

more rapidly than elsewhere or an area because of its substantial existing population may offer more attractive markets and allow greater economies of scale. Other areas might offer greater benefits to the incoming population in terms of access to recreation, social and cultural facilities; while at the same time some social costs might inevitably be incurred—for example loss of attractive landscape.

10.7. A comprehensive exercise to identify and measure all such costs and benefits for Severnside and alternative locations is not possible. Apart from the usual difficulties involved in putting money values on such factors as access to the countryside, an enormous mass of information would be required to make reliable comparisons with other areas. Moreover such comparisons would only be in terms of existing conditions and it should be borne in mind that expansion on the scale discussed in this report would entail far-reaching changes in the regional economy, changes which would to a considerable extent be a matter for speculation.

10.8. Similar difficulties arise in comparing one strategy for Severnside with another. The relative capital and recurrent costs of infrastructure investment of different strategies will depend to a considerable extent on the town designs selected. For example a large part of total drainage costs is accounted for by estate sewers and the cost for this item cannot be determined without more detailed work on layouts. Similarly the roads required by a particular urban form and the way in which settlements are linked will in turn affect the costs and economic viability of the route network. Some forms of development may be more difficult to phase than others and more difficult to operate during the period of construction.

10.9. It should be apparent from the foregoing that there are severe difficulties in applying a comprehensive cost/benefit analysis to a major regional study in which there is no set objective but an unlimited number of possibilities, each of which may be modified by interaction with the others. Moreover we are not yet able to estimate the value of the benefits attributable to alternative strategies or locations. This chapter therefore like the similar one in the Humberside Study is largely devoted to the cost element. An attempt to assemble data on costs is useful for a number of reasons. First, the order of differential costs encountered can be established by reference to a hypothetical minimum cost site and subsequently a limited comparison may be made with the results of similar studies in other areas. Second, some appreciation can be made of resource costs as well as financial costs involved in proposed strategies and third, some significant thresholds can be identified. We must make the reservation that this limited analysis of costs cannot be used as the sole basis for a decision on the adoption of an area for major growth.

Development costs for Severnside

10.10. The generalised nature of the strategies for future growth in Severnside does not permit detailed costings for housing, education and other social services. It is assumed, therefore, for our purposes that in all the possible urban locations the same standards would be maintained in housing, education and most social services and that costs would be incurred broadly *pro rata* to the population and its structure in each settlement. Other components of total cost, however, could be expected to reflect more clearly differences between alternatives. Costs of expansion in central areas would not be a linear function of town size. Likewise communication costs could differ between the various proposals and between Severnside and elsewhere. Drainage and public utility services would similarly reflect variations between the proposed alternatives. The cost of land purchase can be considered as primarily a transfer of assets and not therefore chargeable against any particular proposal though it may influence the willingness of firms and individuals to move to Severnside. The resultant losses in agricultural output or amenity value or potential value in alternative uses are, however, cost items.

Construction costs

10.11. The nature of the physical sieve by which the possible major building areas were selected, described in earlier chapters, suggests that there should not be any great variation in construction costs between the chosen areas. None suffer from high rainfall or other adverse climatic influences nor are any of them remote from sources of building material. Thus there is no reason for anticipating that site considerations and location would produce construction costs markedly different to those obtaining generally in lowland England and Wales.

Public utilities

10.12. Utility services in descending order of their capital costs per capita are drainage, electricity, telephone and postal services, gas and water; these together account for about one-seventh of the total capital cost of urban development. The most costly of these—drainage—was an important factor influencing the selection of the major sites so that areas where costs would be especially high have been avoided. In our study of Humberside we recognised that it was impossible to assess sewerage costs with any degree of reliability in advance of detailed planning and no figure for differential costs for Humberside was put forward. For Severnside we made a comparison between the alternative development patterns by making cost estimates for required trunk and outfall sewers and for sewage treatment. However the variations in cost obtained were of an order which could well be offset by variations in local sewerage costs which depend on estate layout and other factors which cannot be assessed. Most of the larger areas considered are relatively distant from outfalls to a major watercourse and economies of scale are thus offset by the need for costly connecting trunk sewers, often involving tunnelling.

Conversely many of the smaller areas not benefiting in the same way from economies of scale are closer to major watercourses and would involve less costly trunk sewers.

Water supply

10.13. Chapter 4 describes possible sources of water supply to different parts of Severnside and concludes that there are sufficient resources to sustain major expansion. It seems likely that the costs of water supply to Severnside, in general, would be lower than for Humberside. Differences in costs of supply for alternative areas within Severnside would be small but, taking into account questions of water supply, effluent disposal, amenity and flood prevention, there is a general preference for locations on estuaries or the lower reaches of rivers. These factors taken together suggest that some additional cost should be attributed to the Raglan site. If it proved necessary to supply Bristol with water abstracted from the Wye and brought across the estuary this would form a differential cost. Thus our examination of water supply and related questions does suggest that additional costs might be incurred in the case of two of the possible areas. The differential cost of supply for Humberside was put at 6d-1s per 1,000 gallons and it seems reasonable, taking account of variations within Severnside, to put the differential for Severnside broadly at 3d-6d per 1,000 gallons above the cheapest likely site for major development. Capitalized, this additional running cost is of the order of £1½ million to £3 million as against £3 million to £6 million on Humberside for a comparable population growth.[33]

Postal services

10.14. The new urban locations would each possess a central post-office whose size would be governed largely by the total population of the area and the nature of its industries. They would also have a number of satellite offices, fewer and larger with high density, and greater in number and smaller with low density. The more diffuse the development the greater the capital cost of providing a service, including postal transport. Similarly, compact development would allow relatively cheap extension of telephone services.

10.15. For postal services generally, capital expenditure plays a far smaller role than recurrent expenditure. Capital charges are confined to expenditure on buildings, vehicles and mechanisation, provision of which normally takes place organically with the development of the area, as there is not the commitment to install a large amount of equipment before service can be begun. However, as time progresses increased mechanisation will cause capital outlay to become a more important element of expenditure as a whole. To this extent therefore greater economies of scale may be derived in future from large-scale developments.

Electricity and gas

10.16. Exceptional site conditions or very scattered developments increase the costs of providing electricity and gas services but in none of the alternatives considered for Severnside do these conditions arise. As in the case of other utilities a large development is generally likely to permit lower unit costs than a small one. It is unlikely that, with the existing electricity grid system and Severnside's location in relation to it, the cost of providing any new power generating capacity should be attributed to the development of a major growth area. The confluence of transmission lines at Iron Acton north of Bristol sterilizes land which might otherwise be part of the urban development proposed in that area, but this is not a cost which should be attributed to that particular development. In the case of gas, however, some costs should be attributed to Severnside in so far as some additional capacity in the appropriate parts of the national distribution network for natural gas might be required and some capital expenditure might have to be brought forward in time. Moreover, because of the distance of Severnside from the East Coast, the real cost of the national transmission system per customer will be above the average for the United Kingdom although this will not be reflected in terms of tariff charged to Area Gas Boards. In the long-term this differential cost might be reduced if exploitable reserves of natural gas were to be found in proximity to western coasts.

10.17. In the light of the foregoing we consider that with the exception of gas no differential costs for the supply of utility services should be attributed to Severnside in general or to any of the alternative development proposals.

The estuary

10.18. An estuarial location is likely to give rise to some additional costs, which may or may not be balanced by benefits attributable to such a location. In para. 4.21 onwards we describe sections of the inter-urban road network where the growth of traffic will eventually require the duplication of existing routes. It is suggested that a second crossing of the Severn will at some stage be needed and we describe a possible location for such a crossing. Depending on the chosen development pattern, major expansion will advance this time thus bringing forward the capital expenditure needed for construction. Costs will also be incurred as a result of the relatively extended journeys involved in a Severnside development astride the estuary, the scale of such costs again depending on the chosen development pattern. For Humberside we considered that such additional operational costs would be largely offset by the advantages of the estuary, especially for capital-intensive industrial development related to improved port facilities. Realisation of the potential of an estuarial location for industrial development was an intrinsic part of the alternative proposals we examined for Humberside, but this is not the case for our preferred options on Severnside. Taking these various factors into account we put a round figure of £20 million on the differential cost attributable to Severnside in respect of the estuary.

10.19. In our consideration of Humberside we argued that the very large scale of a major growth area would permit extra efficiency in the building operations involved and in the provision of district heating schemes. Severnside does not

(33) Using the test discount rate for public investment in 1970, i.e. 10 per cent.

offer the same possibilities as Humberside where large areas of sparsely populated flat land provide exceptionally good conditions for large-scale systematic building. Nevertheless a 2 per cent reduction in average construction costs for an expansion to accommodate 500,000 population on Severnside—half the Humberside maximum case —would amount to a saving of £10 million.

The value of land

10.20. We have adopted the capitalized value of the most likely alternative use as a measure of the resource cost of land intended for development. The most likely alternative use is, in general, agricultural, but for a number of the alternative sites on Severnside the prospect of some residential, industrial or commercial development without planned expansion is a possibility. Moreover, the existence of celestite deposits, north of Bristol, discussed in Chapter 4 gives rise to the possibility of a loss of mineral resources resulting from urban development or, depending on the depth at which deposits are worked, additional development costs arising from foundation problems on backfilled sites.

10.21. A major expansion on Severnside would inevitably entail a loss of agricultural land and the output lost would depend on the quality of land and farming structure. Where possible we have selected sites which did not use the best agricultural land, so to this extent loss of agricultural output would be minimised. The avoidance of such land could of course lead to additional capital and operating costs in respect of other factors. In the particular circumstances of Severnside, however, we feel that such costs would not be significant.

10.22. There are differing views among economists as to how agricultural land should be valued. For some, no basis for the valuation of agricultural land could be considered as satisfactory unless it took properly into account not only the permanence of agricultural land as a source of production—together with the fact that its amount is limited and that a decision to convert it to other uses is to all intents and purposes irreversible—but also the whole range of unpredictable factors which may govern the future food needs of the community. We have attempted a valuation based on an estimate of lost agricultural output and as in the case of Humberside we have converted output to capital value by using a standard discount rate.[34] Our estimate assumes that net output can be increased by 1 per cent per annum and that the price of agricultural products will rise by 2 per cent per annum relative to other goods and services.

10.23. On this basis and taking into account variations in type of farming and land quality some broad differences between the Severnside alternatives can be identified. Valuation of output on the basis of 25 years purchase at 10 per cent suggests that if all the North Gloucestershire sites had to be used an additional loss of output of up to £10 million would arise as compared to a roughly equivalent acreage in the Bristol-Bath sub-area. But this marked differential is mostly accounted for by the high value of output from horticulture around Dymock in North Gloucestershire, an area which would only be required in the later stages of a major expansion, if at all. If all the North Gloucestershire sites were to be developed the average loss of agricultural output per acre would be greater than that for Humberside while for the rest of Severnside the loss would be less than for Humberside. Costs in excess of those incurred on a minimum cost site would be of the order of £3 million for Monmouthshire-Ross and Bristol-Bath whilst costs for North Gloucestershire would be about £12 million using the Dymock site and £5 million if the Dymock site was not used.[35]

(34) The test discount rate for public investment in 1970 was 10 per cent as against 8 per cent used in the Humberside Study.

(35) Figures relate to use of all sites with an arbitrary reduction for the larger area involved in North Gloucestershire. Acreages involved:—

Monmouthshire-Ross	23,500 acres	All sites considered in each sub-area.
Bristol-Bath	23,500 acres	
North Gloucestershire	29,000 acres	

Costs of assistance to industry

10.24. A number of alternative ways of accommodating large increases of population in the Study Area over and above trend by 2001 are discussed in Chapters 5 and 6 and the prospects for achieving an accelerated rate of growth are considered sub-area by sub-area in Chapter 9. Table 91 of that chapter sets out what might be achieved in accelerating industrial growth by relaxation of idc control, new town procedures and other measures not involving direct financial inducements to industry. The total accelerated growth over and above trend for the period 1981-2001 is estimated at 330,000 population for East Severnside (130,000 in Bristol-Bath and 200,000 in North Gloucestershire). To attain an even higher rate of acceleration it would be necessary to incur costs in the shape of inducements to attract additional industry. Estimation of the order of costs involved is fraught with difficulties not least because the relative attractiveness of Severnside must depend to a considerable degree on the nature and geographical pattern of incentives in the country as a whole at some time in the future. However, if for purposes of comparison between the sub-areas it is assumed that assistance would be required on the scale now obtaining for the Intermediate Areas then for every additional 10,000 population over and above the 330,000 feasible without incentives on East Severnside costs approaching £1 million would be involved. This estimate is based on the assumption that 1,500 new manufacturing jobs for males would be required for each population increment of 10,000.

10.25. Previous chapters have drawn attention to the marked differences in experience and

prospects between Monmouthshire-Ross and the remainder of the Study Area. Experience of new and expended towns suggests that for the development of a major free-standing town at Raglan the demand for new manufacturing industry would be reletively high. Because a large population growth would be a complete break with the pattern of the existing economy end beceuse experience in areas immediately to the east (some suppressed industrial demand) and to the west (the Welsh Development Area) shows such marked contrasts it is exceptionally difficult to judge what help would be needed to sustain industrial expansion. Good road communications and further improvements in prospect together with scenic attractiveness are favourable factors. Moreover it can be anticipated that improved communications coupled with a major expansion in West Severnside would have e stimulating effect on the whole of the Severnside economy with a significant increese in internal trede. Nevertheless it must be acknowledged thet an attempt to achieve expansion of a similer order to that thought feesible on East Severnside would involve the risk of assistance being required for the whole of the build-up period. Allowing for the attractions of a new town and for the effects of an announced Government commitment the cost of inducements to industry in Monmouthshire-Ross could well be of the order of £15 million for en edditionel population increase of sey 200,000.

10.26. The costs we heve quoted ere gross Exchequer costs, but the net costs to the Exchequer allowing for taxetion effects would be lower. Furthermore resource costs would be lower still. The Exchequer costs reflect the rate of favourable treatment thought necessary to induce employment to grow at the required speed. That rate, if accurately assessed, is the one necessary to induce the marginel firm (i.e. the most reluctant firm) to move to the area or for the marginal firm already there to expand. For the marginal firm the payment represents the maximum use of resources that could be involved; for other firms induced to move or expand the real resources used will necessarily be less. Much of the Exchequer cost should therefore be regarded as transfer payment to the recipient firms not involving any corresponding use of resources.

10.27. We must reiterate that our consideration of costs of eccelereted industrial expansion should, ideelly, be accompanied by a consideration of benefits end of the timing of cost and benefit streams. In the cese of the Bristol-Bath subarea it seems likely that any initial costs would be accompanied by an early recoupment in the shape of benefits eccruing from further economies in an already large industrial erea. There is clearly the possibillty, however, thet these might in the long-term be offset by diseconomies of scale to industry, which might aiso be reflected in a wide range of social costs. Indeed e further consideration which in principle should enter into the assessment would be e comparison of the Severnside alternetives with other ereas of the country in terms of relative congestion costs and operating efficiency. Whatever the weight of such considerations they do not enter into the cost comperison attempted here, which is one relative to a hypothetical minimum cost site free of congestion disadvantages.

10.28. These calculations of industrial costs have been included for the seke of completeness. However, we are not recommending that accelereted growth on East Severnside should go to a level for which incentives to industry would be required. Developments at Raglan should be regarded as very long-term indeed.

Operating costs

10.29. In the preceding paragraphs we have only mentioned incidentally questions of recurrent costs. In general, recurrent or operating costs are likely to form the larger element of cost for the development involved in a major expansion of Severnside. For public utilities we have not identified any service which would entail exceptional running costs. As in terms of capital cost, most services involve lower running costs where development is compact but there ere exceptions, for example the costs of police and fire services may well be disproportionately high in large urban areas.

10.30. Transportation investigations have been carried out only to the point where we could be reasonebly satisfied thet the proposed development possibilities are practicable. It is reasonable to assume thet because of the distance between either the Dymock or the Reglan site and possible sources of employment such as Gloucester or Newport a large proportion of the new population in those sites would seek local employment. The journey-to-work movement generated by these areas should therefore be relatively slight in contrast to all other areas considered where there would probably be considerable journey-to-work movement between them and adjoining urban areas. Thus, as a result of development at Frampton Cotterell there could eventually be perhaps two or three times as many workers seeking to travel into Bristol than at present. A simflarproblem could arise at Gloucester particularly with development at Down Hatherley. In each case complicated and expensive redevelopment would be required. Although opportunities for such redevelopment exist, it is a fair assumption that as far as transportation is concerned an urban sub-region strategy involving town expansion would be more costly than one in which major growth was concentrated on new free-standing towns. To a greater or lesser extent such additional costs will be offset by benefits to public and private sectors resulting from large-scale town expansion. However, the question of timing is again important because congestion problems would result if large-scale expansion were embarked upon in advance of the necessary transport provisions.

Summary of differential costs

10.31. We have identified certain differential costs over and above a hypothetical minimum cost site which vary between alternative strategies. No strategy emerges as least cost for every item. The maximum differential identified between sub-areas represents a quite small proportion of total capital and operating costs and certainly does not rule out development of any of the alternative strategies for Severnside. However, the strategy preferred in Chapter 2, a continuation of the trend growth in Monmouthshire-Ross with the possibility of acceleration above trend in North Gloucestershire and Bristol-Bath, does emerge as one of relatively low cost. It is unlikely that this strategy would require the payment of incentives to promote industrial growth and areas with a high value of agricultural output in North Gloucestershire and Monmouthshire-Ross would be avoided. Moreover, although expensive drainage works are required for expansion to the north of Bristol the existing substantial urban infrastructure in Bristol and Gloucester should help to support accelerated population growth and should involve fewer risks of abortive public expenditure than major development in an entirely new location.

INDEX

References are to paragraph numbers

Abergavenny, 5.49, 5.68, 5.70, 7.79

Aerospace industry, 2.5, 7.40, 7.80, 8.31

Agriculture
  agricultural industry, 7.38, 7.46, 7.53, 7.61, 7.74; forecasts, 8.16-8.19
  land use, 4.42–4.43; cost of loss of land taken for development, 10.21-10.23

Agriculture, Fisheries and Food, Ministry of, 8.17, 8.19

Air services, 4.37, 4.39

Aircraft industry
  employment, 7.4-7.5, 7.40, 7.45, 7.47, 7.50, 7.55, 7.61, 7.80, 8.25-8.29
  future prospects, 2.5, 2.11, 5.19, 7.7, 8 30-8.32, 8.36, 9.13

Airports
  possible site for international airport, 6.30
  present development, 4.37-4.40

Amenity
  amenities of the countryside, 4.63-4.70
  places of architectural and historic interest, 4.17-4.18
(*see also* Conservation)

Areas of Outstanding Natural Beauty, 4.67, 5 30, 5.60, 5.65, 6.6

Avonmouth
  docks, 4.82
  industries, 7.40
  possible site for development, 5.7, 5.31

BAC *see* British Aircraft Corporation Ltd.

Banking *see* Service industries

Barnwood, 5.40, 5.45

Barrages, 4.87-4.88, 8.30

Berry, 4.81

Bath
  commuting, 4.9
  industries, 7.40
  shopping centre, 4.4-4.5
  suitability for development, 2.12, 5.9, 5.11, 5.32, 8.4

Berkeley *see* Vale of Berkeley

Berkeley nuclear power station, 5.28—529, 6.9, 6.17

Bettws, 5.51

Boddington, 5.40

Brecon Beacons National Park, 5.68

Brick production, 4.54

Bridgend, 5.75

Bridges, 4.22-4.23, 4.25, 4.29, 4.50, 5.28

Bristol
  capacity for development, 2.13, 2.15-2.17, 2.34, 5.10-5.25, 5.31, 6.16-8.18, 6.28, 8.31, 9.38
  commercial centre, 4.6, 7.4
  commuting, 4.9-4.10, 5.22
  current planning policies, 2.5, 5.9, 6.4-6.5
  development plan, 2.16, 5.9, 6.4
  docks, 4.82, 8.46
  drainage system, 5.15
  education, 4.12
  employment, 4.8, 7.4
  industries, 7.4, 7 40
  office development, 5.22-5.23
  population, 4 3, 5.8, 9.36
  road plans, 5.20
  shopping facilities, 4.4-4.5, 5.21

Bristol-Bath sub-area
  capacity for development, 2.12-2.17, 2.34, 5.8-5.33
  definition, 1.8-1.9
  development plans, 5.8–5 9
  economic conditions, 2.11
  employment, 7.44-7.50; forecasts, 8 50-8.52
  industries, 7.36-7.50; future prospects, 8.50-8.52, 9.13

Bristol Waterworks Company, 4.74

British Aircraft Corporation Ltd., 5.19, 7.40, 8.25-8.26

British Steel Corporation, 4.81, 8.20, 8.21, 8.24, 8.57

British Transport Docks Board, 8.47

Brynmawr, 7.79

Buchanan, *Prof.* Colin, 4 91, 5.32, 6.24

Building industry *see* Construction industry

Business Statistics Office, 7.79, 8.58

Caerleon, 5.51

Ceerwent
capecity for development, 2.28, 5.60-5.61, 6.10, 6.27, 6.29

Caldicot Level
site for industrial development, 2.28, 4.85, 4.89, 5.7, 5.51, 5.56, 5.60, 5.75, 6.29, 8.40

Canals *see* Inland waterways

Cardiff
commercial and edministrative centre, 4.6, 4.8, 7.66
future development, 5.57-5.58, 5.75, 6.24
port, 4.81
shopping centre, 4.4-4.5

Castleton, 5.58, 5.75

Catering Industry, 7.46

Celestite, 4.58-4.61, 5.18

Cement, 4.54

Census of Distribution, 4.4, 4.5

Census of Production, 7.31, 7.32

Centrel Electricity Generating Board, 8.39-8.40

Charfield, 5.16

Cheltenham
capecity for development, 2.19, 2.22, 5.37-5.38, 5.45, 8.19, 6.21, 6.31
commuting, 4.9
current planning policies, 5.35-5.36, 6.4
employment, 7.51, 7.65
shopping centre, 4.4-4.5

Chemicels, 7.40, 7.56, 7.74, 7.75, 8.35

Chepstow, 4.91, 5.51, 5.61, 6.6, 8.58

Chipping Sodbury, 5.8, 5.9, 5.14, 5.26

Churcham, 5.44

Churchdown, 5.40, 5.45

Clevedon, 4 86, 5.9, 7.36, 7.40

Clifton, 5.10

Climate, 4.41

Clothing Industry, 7.40, 8.34

Coel Industry
deposits, 4.55-4.57
employment, 7.6, 7.38, 7.48, 7.51, 7.53, 7.61, 7.68, 7.74, 7.78, 8.37

Coeley, 5.47, 6.5

Coleford, 7.55

Communications *see* Trensport

Commuting, 4.9-4.11, 7.16, 10.30

Conclusions
summary, 2.34

Conservation
conservation towns, 6.6
nature conservetion, 4.64-4.65
pieces of architectural end historic interest, 4.17-4.19
(see *also* Areas of Outstending Natural Beauty; Amenity)

Construction
costs of development, 10.19

Construction industry, 7.7, 7.42, 7.44-7.45, 7.47, 7.50, 7.57, 7.60, 7.71, 8.42-8.43

Coombe Hill canal
site of Special Scientific Interest, 5 37

Costs of development
assistance to industry, 10.24-10.28
construction costs, 10.19
costs and benefits: problems of essessment, 3.12, 10.1-10.9
drainage, 10.12
electricity, 10.16
gas, 10.16-10.17
operating coste, 10.29-10.30
postal services, 10.14-10.15
summery, 10.31
velue of land, 10.20-10.23
water supply, 10.13

Council for British Archeeology, 4.17

Countryside
amenity value, 4.63-4.70
(*see also* Conservetion)

Cwmbran New Town
capecity for development, 5.64-5.66, 5.70, 5.75, 6.23, 9.39
commuting, 4.9
current planning policies, 2.5, 2.26, 5.50-5.51, 6.4, 7.87
employment, 4.8, 7.78, 9.16
industries, 8.55
(*see also* Newport-Cwmbran-Pontypool area)

Dental services
employment, 7.45, 7.61, 7.75

Development Areas
effect on movement of industry, 7.19-7.23, 9.2-9 3, 9.25
Monmouthshire-Rose status, 2.26, 7.6, 7.20-7.21, 7.87, 7.77, 7.80, 8.59

Development plans
Bristol, 2.16, 5.9, 6.4
Bristol-Bath sub-erea, 5.8-5.9
Gloucestershire, 5.9
Monmouthshire-Ross, 5.49-5.53
North Gloucestershire, 5.34-5.35
use in planning stretegy, 6.3-6.8
(*see also* Planning; green belts)

Distribution *see* Census of Distribution, Service Industries

Distribution of industry *see* Industriel location

Docks *see* Ports

Down Hatherley, 2.22, 5.40, 5.45, 6.21, 10 30

Drainage, 4.71, 5.5, 5.15, 10.12

Duffryn, 5.51, 5.75

Durable goods—expenditure survey, 3.20, 4.5

Dursley, 7.55

Dymock
site for development, 2.19, 2.21, 2.24, 2.34, 5.44, 6.10-6.11, 6.26, 8.27, 6 34
value of horticultural land, 10.23

East Severnside
definition, 1.9

Ebbw Vale, 7.79, 8.22

Economic conditions
factor in planning policy, 1.14-1.18, 3.11-3.18
future development to 1976, 2.5, 8.1-8.9, 8.63-8.65
prospects after 1976, 2.5, 9.1-9.9, 9.19-9.22; prospects of accelerated growth, 9.23, 9.40-9.41
present position of Severnside, 7.3-7.7, 7.80

Economic Survey Area, 1.7, 3.14, 4.2, 4.6-4.8

Education, 4.12, 7.7, 7.45, 7.61, 7.72, 7.75

Electricity
costs of development, 10.16
employment in electricity generation, 7.45, 8.39-8.40
nuclear power stations, 4.39, 5.28-5.29, 6.9, 6.17, 8.40
transmission lines, 5.18

Employment
Bristol-Bath sub-area, 7.36-7.50, 8.50-8.52, 9.12-9.13
distribution, 4.6-4.9
earnings and incomes, 7.15
forecasts for period to 1976, 8.4-8.8, 8.13-8.49, 8.63; prospects after 1976, 9.10-9.11, 9.19-9.22; prospects of accelerated growth, 9.23, 9.28-9.30
labour demand and supply compared, 8.60-8.62, 9.17-9.18
Monmouthshire-Ross, 7.66-7.79, 8.55-8.59, 9.16-9.17
national forecasts for period to 1976, 8.10-8.12; prospects after 1976, 9.2-9.3, 9.6-9.9
North Gloucestershire, 7.51-7.65, 8.53-8.54, 9.14-9.15
occupational structure, 7.18
present position, 2.4-2.5, 7.3-7.7, 7.12-7.14, 7.80
self-employed persons, 7.17

Engineering industry, 7.5, 7.7, 7.12, 7.39-7.40, 7.45, 7.51, 7.55, 7.61-7.62, 7.69, 7.74, 7.80, 8.33

Fiddington, 5.37

Filton - and Airfield 5.12, 5.19, 7.40, 8.25-8.26, 8.28

Finance *see* Costs of development; Service industries

Food, drink and tobacco, 7.7, 7.12, 7.39, 7.40, 7.45, 7.65, 7.81, 8.34

Footwear, 7.40, 8.34

Forest of Dean
capacity for development, 5.26, 5.34
current development, 4.2, 5.35
employment, 7.51, 7.53, 7.59, 7.66, 8.54

Forthampton, 5.44

Frampton Cotterell
current development, 5.8, 5.21
site for development, 2.13, 2.34, 5.24, 5.26, 5.31, 10.30

Frome Valley
drainage problems, 5.26, 8.18
site for development, 5.14, 5.15, 5.17

Fuller's earth, 4.52

Gas industry, 7.45, 8.38, 10.16-10.17

Geology, 4.44-4.50

Glamorgan, 4.2, 4.91, 5.75

Glascoed
Royal Ordnance factory, 5.70

Gloster Aircraft Company, 7.5

Gloucester
canal link with Sharpness, 4.80
capacity for development, 2.21-2.22, 2.24, 5.39-5.42, 6.3, 6.19, 6.21, 8.31
commuting, 4.9-4.10
conservation, 4.18
current development, 4.11, 5.35, 8.4
education, 4.12
employment, 4.8, 7.51, 7.65
housing, 4.14
shopping facilities, 4.4-4.5

Gloucestershire County Development Plan, 5.9

Goetre, 5.70

Gravel, 4.53

Green belts, 4.89, 5.7, 5.9, 5.13, 5.31, 5.38, 5.42, 5.48, 6.13, 6.16

Gwent Water Board, 4.74

Hafodyrynys Colliery, 7.76, 8.37, 8.55

Hardwicke, 5.41, 5.45

Hatherley, 5.38

Health and welfare services, 4.12-4.13
(*see also* Medical services)

Hester's Way, 5.36

Highnam, 5.43, 5.44, 5.45

Historic buildings, 4.17-4.18

Housing
needs, 4.14-4.16
residential densities, 3.8

Huntley, 5.43-5.44, 5.45

Idc's *see* Industrial development certificates

Imperial Chemical Industries Ltd.
I.C.I. Fibres Ltd., 5.70, 8.66
Pining plant, 4.89

Industrial development certificates, 2.7, 7.21-7.22, 9.4, 9.24-9.25

Industrial location
new distribution of industry, 2.7
movement of industry to Severnside, 7.19-7.24
(*see also* Industrial development certificates; Development areas; Intermediate areas)

Industrial Survey, 3.14, 7.2, 7.25, 7.31, 8.6

Industry
assistance to industry, costs of, 10.24-10.28
Bristol-Bath sub-area, 7.36-7.50, 8.50-8.52, 9.12-9.13
forecasts for period to 1976, 8.4-8.6, 8.10-8.64
markets and destinations of goods, 7.26-7.30
Monmouthshire-Ross, 7.66-7.79, 8.55-8.59, 9.16
North Gloucestershire, 7.51-7.65, 8.53-8.54, 9.14-9.16
productivity, 7.31-7.35
prospects after 1976, 9.2-9.22; prospects of accelerated growth, 9.23-9.41
sites for development, 4.89, 6.29
(*see also* Manufacturing industries; Maritime Industrial Development Areas; Primary industries; Service industries, and entries for individual industries)

Inland waterways
Coombe Hill Canal, 5.37
recreational value, 4.89
Sharpness Canal, 4.74, 4.80, 5.39, 5.41

Innsworth, 5.40

Institute of Geological Sciences, 4.61

Insurance *see* Service Industries

Intermediate areas
effect on movement of industry, 7.23, 9.2, 9.3, 10.24
Monmouthshire-Ross status, 2.26, 7.6, 7.67, 7.79, 7.80, 8.59
(*see also* Development areas)

Iron Acton, 5.18, 5.21, 10.16

Iron and steel industry, 7.6, 7.68, 7.69, 7.74, 7.80, 8.20-8.24, 8.47
(*see also* Spencer Steelworks, Llanwern)

Iron oxides, 4.62

Journey-to-work systems *see* Commuting

Keynsham, 7.40

Labour *see* Employment

Land
agricultural land, 4.42-4.43
industrial land, 4.89
land available for development, 2.8, 4.89-4.91, 5.1-5.7, 5.77-5.78
land required for development, 1.1, 1.11-1.12, 3.9-3.10
value of land: costs of development, 10.20-10.23
(*see also* Planning)

Land-use/transportation studies, 1.13, 3.19

Landscape *see* Areas of Outstanding Natural Beauty

Ledbury, 5.43, 5.44

Limestone, 4.52, 5.16

Llanarth, 5.69, 5.76

Llandegfedd, 5.62, 5.70

Llanfrechfa, 5.67, 5.70

Llanhennock, 5.62

Llantillio Crossenny, 5.71

Llantrisant, 4.91, 5.75, 8.24

Llanwern steelworks *see* Spencer Steelworks, Llanwern

Local government
employment, 7.43, 7.81, 7.72

Location of industry *see* Industrial location

Longlevens, 5.40

Luisgate Airport, 4.37-4.39

Malpas, 5.51, 5.63

Mamhilad, 5.70

Man-made fibres, 7.58

Manufacturing industry
employment, 7.5, 7.39-7.41, 7.54-7.56, 7.60, 7.63-7.65, 7.68-7.70, 7.73, 7.77, 7.80, 8.33-8.38
movement to Severnside, 7.19-7.24, 7.49, 7.77

Maritime Industrial Development Areas, 4.85-4.88, 6.28-6.30

Medical services
employment, 7.46, 7.61, 7.75
(*see also* Health and welfare)

Michaelstone, 5.58, 5.75

MIDA *see* Maritime Industrial Development Areas

Midsomer Norton, 7.38

Milford Haven, 4.80

Mineral deposits, 4.51-4.62, 8.16

Ministry of Agriculture, Fisheries and Food, 8.17, 8.19

Ministry of Transport. *Roads for the future*, 4.24-4.26, 4.31

Monmouth, 5.49, 5.68, 6.6, 8.58

Monmouthshire-Ross sub-area
capacity for development, 2.26-2.29, 2.34, 5.54-5.76, 6.23-6.26, 9.39
definition, 1.8-1.9
development area status, 2.26, 7.6, 7.20-7.21, 7.67, 7.77, 7.80, 8.59
development plans, 5.49-5.53
economic conditions, 2.28
employment, 7.66-7.79; forecasts, 8.55-8.59, 9.16
industries, 7.66-7.79; future prospects, 8.55-8.59, 9.16
land-use/transportation studies, 3.19

Moreton-in-Marsh, 7.51

Motorways, 4.21-4.30
(*see also* Roads)

Nailsea, 5.9, 8.30, 8.5, 8.6

National Coal Board, 4.57

National Income and Expenditure, 7.31

National Ports Council, 4.85

National Trust, 4.17, 5.10

Nature Conservancy
survey, 4.84-4.86, 5.77

Newent, 5.43, 5.44

New towns *see* Planning; Cwmbran New Town

Newport
capacity for development, 2.26-2.27, 2.34, 5.62-5.67, 5.75, 6.3, 6.23-6.24, 6.26
commuting, 4.9-4.10
current planning proposals, 5.51, 8.4
industries and employment, 4.8-4.8, 7.66, 7.79, 8.56, 9.16
port, 4.81, 7.66, 8.57
roads, 4.29, 5.63, 8.70
shopping centre, 4.4

Newport-Cwmbran-Pontypool area
area for urban development, 2.26, 2.27, 2.29, 4.2, 4.11, 5.70, 6.14, 6.23, 6.25, 6.31, 9.16

North Gloucestershire sub-area
capacity for development, 2.18-2.25, 5.36-5.47, 6.19-6.22, 6.26
definition, 1.8-1.9
development plans, 5.34-5.35
economic conditions, 2.18
industries and employment, 7.51-7.55; future prospects, 8.53-8.54, 9.15, 9.37
land-use/transportation studies, 3.19

North West Gloucestershire Water Board, 4.74

Northleach, 7.51

Norton Radstock, 4.2, 6.6

Nuclear power stations *see* Electricity

Office of Population Censuses and Surveys, 8.7, 9.10

Oil, 8.41

Oldbury, 5.29

Paper and board industries, 7.45, 8.34

Parke Davis & Co., 5.70

Patchway, 5.13, 5.19, 8.25-8.26

Penhow, 5.61

Petroleum, 8.41

Planning
definition of terms, 3.3
development of urban sub-regions: strategy, 6.14-6.27; preferred solution, 6.31-6.36
development plan strategy, 6.4-6.8
economic approach, 1.14-1.16, 3.11-3.18
land-use/transportation studies, 3.19
need for planning, 1.1-1.5
new towns strategy, 6.9-6.13
physical planning approach, 1.12-1.13, 1.15-1.18, 3.4-3.10, 3.18-3.21: alternative strategies, 2.9, 2.30, 6.1-6.3; potential of Severnside, 4.1, 4.92-4.93
problems of growth, 2.31, 9.38-9.39
shopping model, 3.20
time-scales, 1.10, 3.1-3.2
(*see also* Development plans; Green belts; Land)

Pontypool
capacity for development, 2.26, 5.64, 5.70, 5.75
employment, 7.76, 8.55
present development, 4.9, 5.49, 5.51, 6.4
(*see also* Newport-Cwmbran-Pontypool area)

Population
capacity of Severnside, 2.6-2.10, 2.31; Bristol-Bath sub-area, 2.16-2.17; Monmouthshire-Ross, 2.27-2.29; North Gloucestershire, 2.19, 2.25
forecasts, 8.7-8.9, 9.5-9.7, 9.10, 9.21, 9.22, 9.32-9.41
geographical distribution, 4.2-4.3
growth: national, 1.2, 1.4, 3.1; Severnside, 2.3, 3.4, 7.6-7.11; current planning provision, 8.8
migration, 1.3, 7.8, 8.7

Port Talbot, 4.81, 5.75

Ports
development and importance, 4.79-4.84
Newport docks, 4.81, 7.56, 8.57
traffic, 8.44-8.47

Portskewett
proposed site for nuclear power station, 4.89, 5.60, 8.40

Postal services
costs of development, 10.14-10.15

Prestbury, 5.36

Primary industries, 7.36, 7.48, 7.53, 7.68, 9.8-9.9

Printing and publishing, 7.40, 8.34

Quedgeley, 5.41

Raglan
capacity for development, 2.28, 2.34, 5.69, 5.71, 5.72, 5.76, 6.10-6.11, 6.13, 6.30, 6.34, 10.25, 10.26
road problems, 4.30-4.31

Railways, 4.32-4.36, 7.48, 7.73

Rangeworthy, 5.21

Recreational facilities, 4.66-4.70

Retail trade
employment, 7.45, 7.61, 7.75
(*see also* Shopping centres)

Rhoose Airport, 4.37-4.39

Rhymney Valley, 5.57, 5.58

Rivers
recreational value, 4.68-4.69

Roads
Bristol road plan, 5.20
Gloucester development, 5.41, 5.45
inter-urban network, 4.21-4.31, 5.63, 5.70
Severn Bridge, 4.29
Severn Estuary additional crossing, 4.23
Severn West Bank development, 5.45
Roads for the future, 4.24-4.28, 4.31

Rogerstone, 5.51

Rolls-Royce Ltd., 7.40, 8.25-8.26, 8.29

Ross-on-Wye, 1.8, 4.2, 4.91, 5.49
conservation town, 5.74, 6.6
employment, 8.56

Royal Naval Propellant Factory, Caerwent, 5.61, 7.74

Royal Ordnance Factory, Glascoed, 5.70

St Athan RAF station, 4.38

St Mellons, 5.57, 5.58, 5.75

Sand, 4.51, 4.53

Sandstone, 4.51, 4.52

Service industries, 7.4, 7.43, 7.58, 7.72, 7.73, 8.46, 9.8-9.9

Severn Bridge, 4.22-4.23, 4.25, 4.29

Severn Estuary
additional crossing considered, 4.23, 4.50, 5.28
barrages, 4.87-4.88, 6.30
capacity for development, 6.28-6.30; costs, 10.18-10.19
MIDA proposal, 4.85-4.86, 6.28-6.30
ports, 4.79-4.84
possible airport site, 4.40, 6.28, 6.30

Severnside
capacity for development, 1.5, 1.11-1.13, 2.1-2.10, 2.30-2.31, 4.1, 4.92-4.93, 6 31-6 35; conclusions, 2.34; effect on neighbouring areas, 2.32-2.33
communications, 4.20-4.40
costs of development, 10.1-10.10, 10 31
economic assessment, 1.14-1.16, 2.5, 3.11-3.18, 7.3-7 7, 7.80
economic prospects to 1976, 9.1-9.6, 9.65; after 1976, 9.10-9.11, 9.19-9.23
land available for development, 4.89-4.91, 5.1-5.7, 5.77-5.78
location and definition, 1.7-1.9
natural features and resources, 4.41-4.78
urban and social infrastructure, 4.2-4.19

Sewerage, 4.71, 5.5, 5.15, 5.72, 10.12

Sharpness, 4.60, 5.28

Sharpness Canal, 4.74, 4.80, 5.39, 5.41

Shopping centres
Bristol shopping facilities, 5.21
importance in planning, 4.4-4.5

Shopping model (Nathaniel Lichfield and Associates) 3.20, 4.5

Slimbridge
land for development, 5.13
Wildfowl Trust land, 4.64

South Western Gas Board, 8.38

Spencer Steelworks, Llanwern
employment, 2.28, 4.9, 7.6-7.7, 7.69, 7.73, 7.74, 7.77, 7.80, 8.56
location, 4 89, 5.56, 5.60, 5.63
products, 8.20, 8.22

Statistics of Trade Act 1947, 7.65

Staunton, 5.44, 5.45

Stavarton, 5.40

Stavarton Airfield, 4.37-4.38, 5.40

Steel industry *see* Iron and steel industry

Stinchcombe Hill, 5.13

Stoke Gifford, 5.13, 5.19, 5.20

Stroud, 7.51, 7.55, 7.65

Stroud valleys
capacity for development, 5.47, 6.5
commuting, 4.9
population, 5.34, 5.35

Swansea, 4.4, 4.81, 5.75, 8.47

Swindon, 4.4

Taynton, 5.44

Tewkesbury, 5.35, 5.37, 6.6

Textiles, 7.5, 7.51, 7.55, 7.61

Thornbury, 5.9, 5.29, 5.31, 6.5

Tibberton, 5.44

Time-scales for forward planning, 1.10, 3.1-3.3

Tirpentwys Colliery, 7.78, 8.55

Tobacco industry *see* Food, drink and tobacco

Trade flows, 7.25-7.30

Transport, 3.8, 4.20-4.40
(*see also* Airports, Commuting, Inland waterways, Railways, Roads)

Transportation studies, 1.13, 3.19

Travel-to-work *see* Commuting

Trumpet, 4.91, 5.43

Universities, 4.12

Urban development
nature of future urban areas, 3.5-3.10
new towns strategy, 6.9-6.13
urban renewal, 1.1
urban sub-regions strategy, 6.14-6.27, 6.31-6.36
(*see also* Land: land available for development)

Urban hierarchy
factor in physical planning, 4.2-4.11

Usk, 5.49, 5.58

Uskmouth, 4.81, 4.89, 5.63, 8.57

Vale of Berkeley
capacity for development, 5.9, 5.14, 5.27-5.28, 5.31, 6.9, 6.16, 6.17

Vale of Glamorgan *see* Glamorgan

Wales Gas Board, 8.38

Wapley, 5.26, 5.31, 6.17, 6.26

Water Resources Board
estimates of future demands, 4.73-4.76

Water supplies
costs of development, 10.13
employment, 7.45
sources, 4.72-4.73; future demands, 4.74-4.78

Welfare services, 4.13

Welsh Grounds
possible site for airport, 5.56, 5.60, 6.28

Wentlooge Level
site for industrial development, 4.85, 4.89, 5.55, 6 24

Wentwood, 5.59, 5.60, 6.9

West Severnside
definition, 1.9

Westerleigh Junction, 5.20

Westland Aircraft Ltd, 8.25, 8.32

Weston-super-Mare
capacity for development, 2.12, 2.16, 5.32
commuting, 4.9
current planning policies, 5.9, 6.5, 8.8
employment, 4.8, 7.36, 8.32, 8.52
holiday traffic, 4.68
shopping centre, 4.4, 4.5

Wickwar, 5.16

Wildfowl Trust, 4.64

Winterbourne, 5.8, 5.21

Worcester, 2.21

Wye Valley
  Aree of Outstanding Naturel Beeuty, 5.66
  unsuitability as site for development, 5.74

Yate
  celestite deposits, 4.58-4.60, 5.16
  current planning policies, 5.9, 5.21, 5.31, 6.5
  engineering industry, 7.40

Yatton, 5.30

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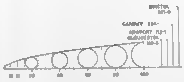
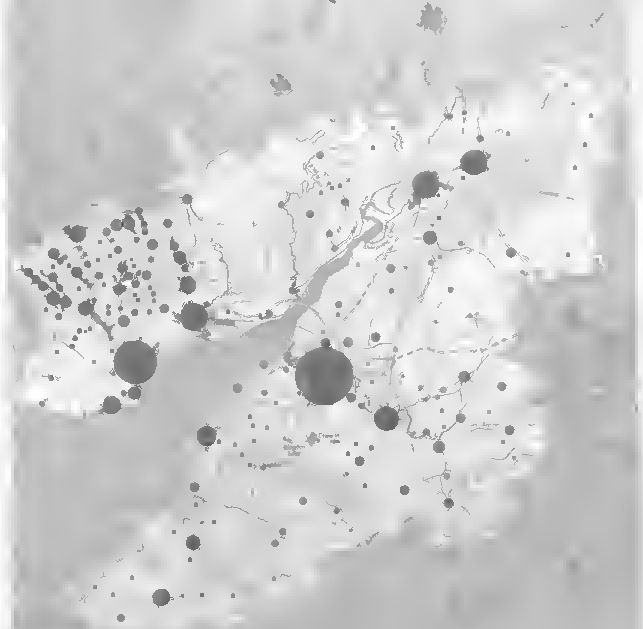
POPULATION OF BUILT-UP AREAS 1966





he estimated population of each continuously built up area
ng a population of 1,000 or more is represented by the area
o price. Some 97% of the total population of the Economic
Survey Area live within these areas
Derived from local planning authorities' land use records and the
1966 Census

JOURNEY TO WORK 1966

Person movements affecting the Study Area

JOBS

MOVEMENT

SCALE

DIRECTION

Main Urban Area Aggregate

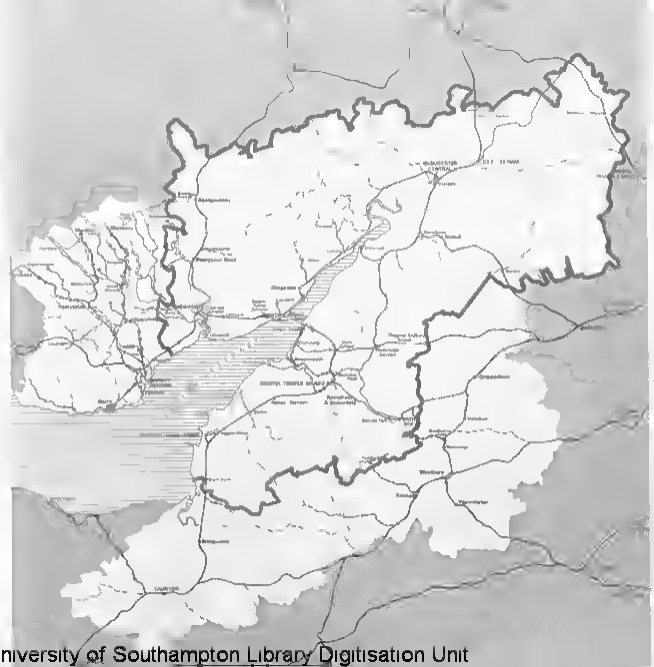
Other Towns

Main railways

CIVILIAN POPULATION CHANGE
1951 – 1966

By Local Authority Areas
Compiled from the Registrar-General's
mid year civilian estimates

RAIL TRANSPORT 1970



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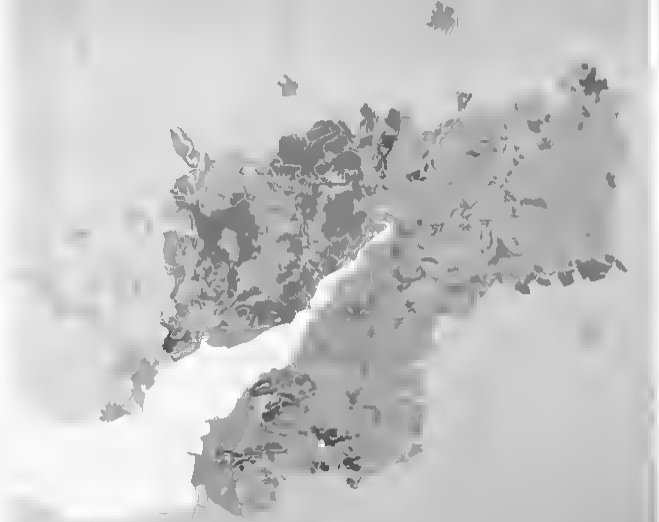
AGRICULTURAL LAND CLASSIFICATION



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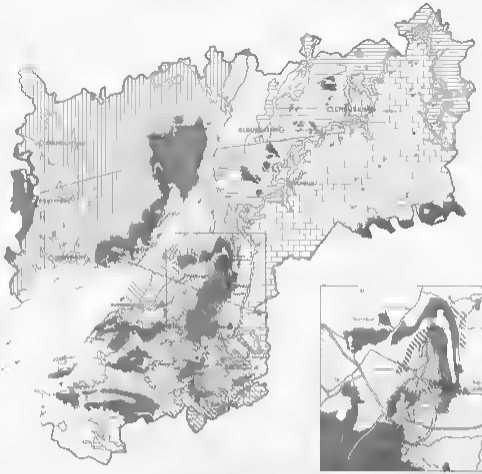
GEOLOGY AND MINERALS



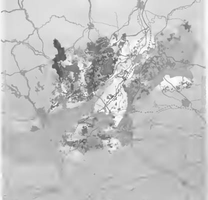
9

COUNTRYSIDE CONSERVATION

AREAS OF SPECIAL LANDSCAPE VALUE

AGRICULTURAL LAND

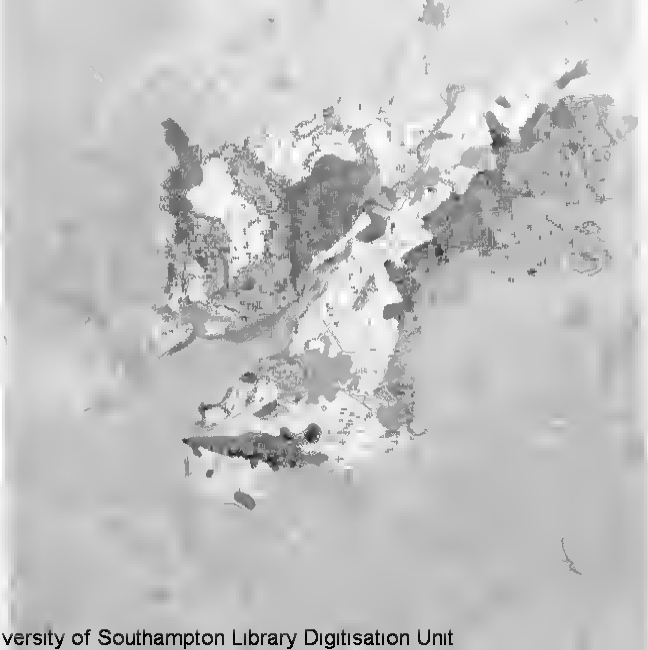
NATURE CONSERVATION



The a[illegible] nclude part of the Brecon Beacons N[illegible] of the Wye Valley Malvern. Co[illegible] which are confirmed or enda[illegible] standing natural beauty under the National Parks and Access to the Countryside Act. The areas of great landscape value are as defined in the statutory development plans; the additional areas are those identified by the CUEP.

The protected woodlands cover dedicated woodlands and land held by the Forestry Commission.

The nature conservation areas are those scheduled under s.23 of the National Parks and Access to the Countryside Act.



NATURE CONSERVATION

PRIORITY ZONES

First

Second

AREAS OF WILDLIFE CONSERVATION INTEREST

High

Intermediate

Low

Each 5/8th square with a which there is a signi cant wildlife conservation interest is identified by a symbol indicating the degree of interest. Some small areas of high ecological value are outside the generalized conservation priority zones

Derived from information supplied by the Nature Conservancy.

DRAINAGE

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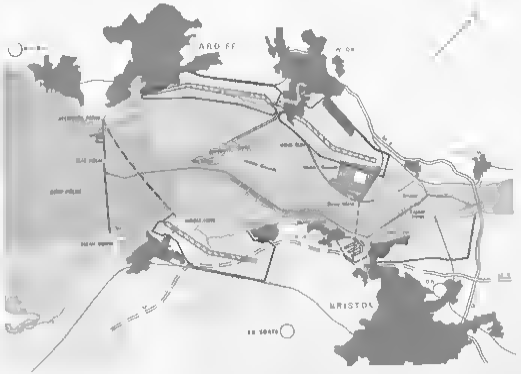
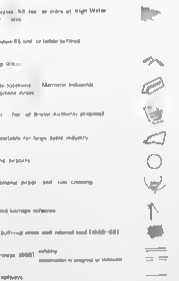
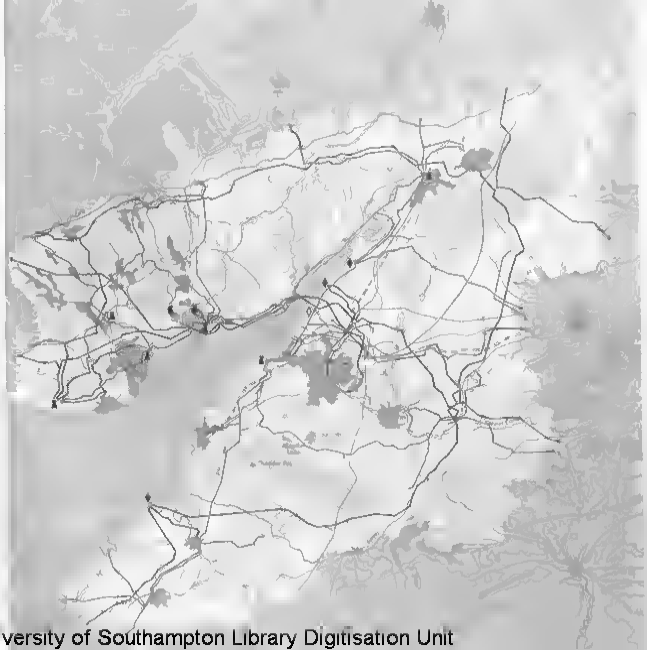


SEVERN ESTUARY



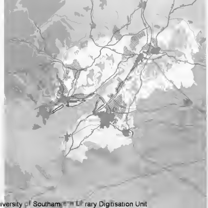
POWER 1970



ELECTRICITY

GAS

Derived from information supplied by the Department of Trade and Industry and by the electricity and gas undertakings



SELECTED AREAS OF SEARCH

Possible areas for:

- large scale urban development
- major industrial sites

Motorways

Roads

Railways

Rivers and canals

Land lying over 200ft

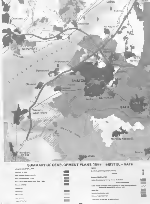
Land above 500ft

MILES

KILOMETRES

The proposals indicated embrace land use allocations in statutory development plans, outstanding planning permissions and other commitments.

Proposed [illegible] not yet approved by local planning authorities.



SUMMARY OF DEVELOPMENT PLANS 1965 BRISTOL – BATH

DEVELOPMENT OPPORTUNITIES BRISTOL BATH

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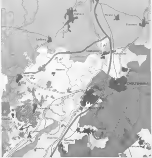
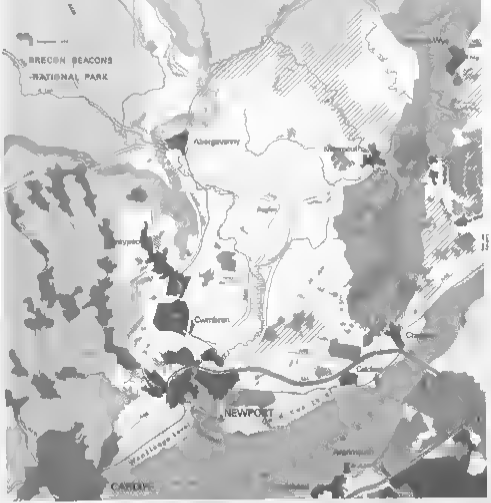
... information supplied by local planning authorities.



SUMMARY OF DEVELOPMENT PLANS 1968 NORTH GLOUCESTERSHIRE

DEVELOPMENT OPPORTUNITIES NORTH GLOUCESTERSHIRE

[illegible] development areas are those identified in the Study [illegible] y suitable for large scale building. Possible lines for new [illegible] might be needed in conjunction with the development [illegible] indicated



SUMMARY OF DEVELOPMENT PLANS 1966 MONMOUTHSHIRE - ROSS

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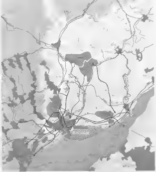

DEVELOPMENT OPPORTUNITIES MONMOUTHSHIRE ROSS

DEVELOPMENT OPPORTUNITIES SUMMARY